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Volume Author/Editor: Wesley Clair Mitchell

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Chapter Author: Wesley Clair Mitchell

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## CHAPTER IV.

## THE CONTRIBUTION OF BUSINESS ANNALS.

### I. The National Bureau's Collection of Business Annals.

Several of the theorists whose writings were laid under contribution in Chapter I—notably Tugan-Baranovski, Bouniatian and Lescure—have devoted much attention to the history of crises and depressions. Similarly, some of the statisticians referred to in Chapter III—for example, Warren M. Persons and his colleagues—have supplemented their time series on occasion by preparing annual summaries of business conditions. But the histories have dealt largely with what was common in the episodes treated, and the summaries have been confined to rather brief periods in a few countries. For theoretical uses, there is needed a systematic record of cyclical alternations of prosperity and depression, covering all countries in which the phenomena have appeared, and designed to make clear the recurrent features of the alternations. If the view taken in Chapter II of the circumstances under which business cycles occur is valid, it may not be impracticable to make a modest descriptive record of this sort which approximates completeness.

While the National Bureau of Economic Research has not been able to perform this whole task, it has sought to form a larger collection of what we may call "business annals" than has been available hitherto. Dr. Willard L. Thorp, who directed the work of compilation, ransacked the rich resources of the New York Public Library for official documents, reports, pamphlets, periodicals, and books dealing systematically or incidentally with business conditions in various countries. The generous coöperation of several foreign scholars brought additional materials and special knowledge to the work.[1] For every year and every country covered, the plan required a digest

[1] Professor Albert Aftalion of Paris reviewed the French annals, Dr. Robert R. Kuczynski of Berlin the German annals, Dr. F. A. von Hayek of Vienna the Austrian annals, Dr. Robert F. Foerster the Italian annals, Dr. E. H. D. Arndt of Transvaal University the South African annals, and Drs. N. D. Kondratieff, A. L. Vainstein and M. B. Ignatieff of the Conjuncture Institute, Moscow, the Russian annals.

of contemporary opinions concerning (1) industrial, commercial and labor conditions, (2) conditions in the markets for loans, securities, and foreign exchange, (3) agricultural production and prices, and (4) non-economic occurrences, such as political events, epidemics, floods or earthquakes, which seem to have influenced business appreciably. From such information as he could gather upon these four heads, Dr. Thorp formed his own opinion concerning the phase of the business cycle through which the country in question was passing each year, and expressed his opinion in a brief caption.

Annals of this sort for the United States have been carried back to 1790, the first year after the adoption of the Constitution. To make possible international comparisons from the beginning of the American record, English annals have been compiled for the same 136 years. Lack of accessible sources, or lack of economic unity, made it difficult to go back of 1840 in France, 1853 in Germany, and 1867 in Austria. To show the geographical spread of business fluctuations in recent times, several other countries were added to the five covered in the long-period studies. With 1890 as the starting-point in all cases, Italy, the Netherlands, Sweden, and Russia were chosen to show diversified conditions in Europe. Next, three great English-speaking colonies on three continents were taken—Canada, Australia, and South Africa. To represent South America, Argentina and Brazil seemed fittest. Finally the foremost Oriental civilizations were included—British India, Japan and China. Needless to say, the sample might well have been enlarged, both by carrying the annals back to earlier dates in several of the nations covered, and by including at least a dozen other countries. The National Bureau hopes that what it lacked means to accomplish may be done by men who have access to the fullest records available for the periods and the countries it has omitted.

Limited as it is in scope, our collection of annals attained proportions and a promise of usefulness which called for independent publication. In the present book, we can use the volume of *Business Annals* much as we use the coördinate statistical series.[2]

[2] See *Business Annals*, by Willard Long Thorp, Publications of the National Bureau of Economic Research, No. 8, New York, 1926.

The present chapter consists mainly of the "Introduction" which I contributed to Dr. Thorp's book, with such omissions, emendations, and additions as are suggested by its relation to earlier chapters, or by sober second thoughts. Once more I may thank the National Bureau's staff, especially Dr. Frederick C. Mills and Dr. Thorp, for much help in analyzing the material contained in the annals.

## II. The Trustworthiness of Business Annals.

### 1. Sources and Methods of Compilation.

The materials with which compilers of business annals work lack the objectivity, as well as the formal precision, of statistics. A man's opinion concerning the fortunes of business in a given year is affected by his personal interests, his training, his opportunities for making observations himself and collecting the observations of others, his aptitude for generalizing, and the care with which he studies his evidence.

One who begins sampling contemporary opinions concerning business conditions in any country with this reflection in mind, will be impressed less by the differences among the conclusions reached by various observers than by their consensus. In the majority of years, business developments are dominated by a trend so clear that it impresses every thoughtful observer, whatever his personal equation may be. Of course, there are years in the record of every country when such is not the case. When the investigator finds serious discrepancies among his sources, he must sometimes ascribe them to bias or incompetence on the part of one or more writers; but more often he discovers that the writers who seem to disagree referred to different industries or different sections of a country—industries or sections which had divergent fortunes.

As the activities of a people get more definitely organized on the basis of business economy, the sources of information concerning business become more numerous, more reliable, and more alike in tenor. On the one hand, different industries and different sections of the country are tied more closely together, so that prosperity or depression in one affects more, and is more affected by, prosperity or depression in others. We shall have occasion to observe, for example, that the American annals reveal greater similarity of fortunes in the opening years of the 20th century than in the closing years of the 18th century. On the other hand, business reporting becomes a profession, and undergoes a development comparable in character to the contemporary development in gathering statistics. Indeed, these two developments foster one another. Since about the middle of the 19th century in England and the United States, and since later dates in other countries, there have been established an increasing

number of periodicals which report business developments weekly or monthly to critical circles of subscribers. Government agencies, especially the consular offices, render similar services to the whole business public. In recent years, it is possible to find for all the countries included in our annals several sources of information, domestic or foreign, which can be checked against each other. In default of local periodicals, British, French and American consular reports can be drawn upon for information concerning trade in every quarter of the world. And besides the reports made at regular intervals for every country, there is a much longer list of pamphlets and books which throw light upon business affairs at different times. The bibliography appended to Dr. Thorp's report shows how numerous and how varied are the sources upon which a diligent compiler of business annals can draw.

In proportion as his sources multiply, an alert compiler, like an alert historian, realizes that his own work has its subjective side. The few sentences he writes to summarize the mass of material are colored by his personal equation, compounded of his preconceptions, his knowledge and his ignorance, his technical training, and all the other characteristics which enter subtly into his appreciation of various bits of evidence. From the same set of sources, no two compilers will make quite the same summaries. In most years, the differences will be slight in comparison with the similarities; but in the years when business conditions as seen by contemporaries are confused, two compilers may get appreciably different impressions concerning the situation as a whole.

Perhaps the gravest danger lurking in the statistical treatment of social problems is that, once data have been compiled into neatly published tables, the figures gain a pontifical authority over many minds. Field statisticians who provide the original data usually retain a prudent skepticism concerning the representative value of the precise-seeming results toward which they have contributed. But "arm-chair statisticians," who have never filled in a questionnaire from interviews, deciphered a factory payroll, audited the accounts of a business enterprise, or assessed the value of a stock of merchandise, are prone to put unmerited confidence in tables they wish to analyze. Business annals have not yet won undeserved credit. But it is not premature to point out that the crisp phrases, in which a compiler of annals sets down his conclusions for country after country and year after year, are as much subject to a margin of error as are

statistical summaries. The compiler, like the statistical field worker, is sure that the width of this margin varies from entry to entry; but, again like the field statistician, he cannot feel much confidence in his own estimate of his probable error.

### 2. A Comparison of Business Annals and Business Indexes.

Fortunately, there is a way of testing two samples of the National Bureau's annals objectively. As seen in the preceding chapter, we have statistical indexes of business conditions in the United States and England which cover considerable periods. If these series deserve their name, the fluctuations which they show in economic activity and the business changes which our annals describe may be expected to run similar courses.

While Dr. Thorp and his assistants have made some use of statistical tables in compiling their annals, and while the writers whose observations constitute their sources have done likewise, it is by no means a foregone conclusion that the annals and the indexes of business activity will agree closely. For the data used in making the indexes cover a much narrower range of economic activities than are represented in the annual business reviews of such sources as consular reports, the London *Economist,* Raffalovich's *Marché Financier,* or the *Financial Review.* Moreover, in so far as consuls, or editors, or our own compilers have used statistics in drawing their conclusions, they have used the data in unadjusted, or but slightly altered form. The statisticians who make business indexes, on the other hand, subject their data to the elaborate series of transformations described in Chapter III. They compute and eliminate secular trends; often they eliminate also seasonal variations; in some cases they seek to eliminate the effects of price fluctuations. When they are combining several series, they may reduce the fluctuations of each to units of its standard deviation, and "weight" their averages as best they can. As a final step they often "smooth" their curves. All these operations are quite different from those which a financial editor performs when he passes through his mind reports from many cities and many industries, and sets down his broad conclusion concerning the course of business as a whole. The statistical operations are more objective and more precise; but they deal with more limited data, and deal with them in a more circumscribed and mechanical fashion.

To all acquainted with the making of the two types of summaries, it will be clear that a comparison between the annals of business and the statistical indexes of business activity is quite as much a test of the latter as of the former. The makers of the statistical indexes are usually careful to point out the limitations of their results, and eager to compare them with the results of other investigations. They recognize (1) that the original data are subject to varying margins of error; (2) that the technical methods of eliminating secular trends, seasonal fluctuations, and the effects of price variations are far from perfect; (3) that the residuals left in time series by these eliminations contain not merely the cyclical fluctuations, but also the effects of random factors peculiar to the series used. Even if a statistician had relatively abundant raw materials to work up, he would not claim that his results formed a strictly accurate record of changes in business conditions. In his eyes the best results he can get remain approximations, limited by the errors of the underlying data and the uncertainties of his technical methods.

But the most serious limitation is that the statistician who seeks to cover a considerable period can find but few time series fit for his purpose. The indexes of general business or volume of trade which run back of the great war must be made on one of two plans. Either they must be records of a single type of activity—like Mr. Carl Snyder's "clearings index of business"—or they must be made by averaging the fluctuations of groups of series which themselves change from time to time—like the American Telephone and Telegraph Company's "index of general business conditions," or Professor Warren M. Persons' "index of trade."

Now, no single type of transactions—not even such an inclusive type as the volume of checks cleared in all reporting towns outside of New York—can be taken to represent all the important phases of business activity. The payments made by check in the towns which have no clearing houses, and the payments made in coin and paper money may undergo fluctuations which differ in amplitude and timing from the fluctuations of clearings. That is merely a doubt concerning the faithfulness with which clearings represent changes in total payments. Far more important is the certainty that the volume of payments made by check within a given period undergoes fluctuations materially different from the fluctuations which are taking place in the volume of goods produced, shipped, or consumed, and different

from the fluctuations in employment, the disbursing of income, and the purchasing of consumers' goods. Yet the latter processes are quite as much a part of business as is paying bills by check.

The indexes made by averaging the fluctuations of several series represent a wider range of activities. But the activities which can be included are those for which a statistical record happens to have been made for a relatively long period—not the activities which a statistician would choose were he planning an index. Moreover, the changes in the lists of series which are available for successive decades raise grave questions about the comparability of the results for the earlier and the later years covered. Finally, there are puzzling questions about the interpretation of a composite made by averaging the fluctuations of series so different as (say) price indexes, values of goods imported, and tons of pig iron produced.

What we have in our business annals and our indexes of general business conditions, then, are different approaches to the problem of recording the fluctuations of economic activities—approaches each of which has its uncertainties as well as its merits. We cannot expect them to agree perfectly. When they disagree we cannot say that the discrepancy necessarily means error in one or all; it may mean merely that the different activities reflected by the various approaches really did not change in quite the same way. But if we find a general consilience among the results we shall feel increased confidence in the reliability of both approaches, and may regard the occasional discrepancies as presenting genuine problems from the study of which fresh knowledge may be gained.

The charts which follow offer as graphic a comparison as can well be made between our annals and the leading American and British indexes of general trade which cover considerable periods. In the column for each year is entered a brief characterization of business conditions drawn from the annals, and above are plotted the index curves.[1] The curves show cyclical fluctuations above and below the moving base traced by the monthly ordinates of the secular trends of

[1] For the methods followed in making the two American indexes used in Chart 21, see M. C. Rorty, "The Statistical Control of Business Activities." *Harvard Business Review*, January, 1923, vol. 1, pp. 154-166, and Carl Snyder, "A New Clearings Index of Business for Fifty Years," *Journal of the American Statistical Association*, September, 1924, vol. xix, pp. 329-335.

For the recent items in the two series, we are indebted respectively to Mr. Seymour L. Andrew, Chief Statistician of the American Telephone and Telegraph Company, and to Mr. Snyder of the Federal Reserve Bank of New York.

CHART 21. Business Fluctuations in the United States, as shown by the Annals and by Two Statistical Indexes, 1875-1925.

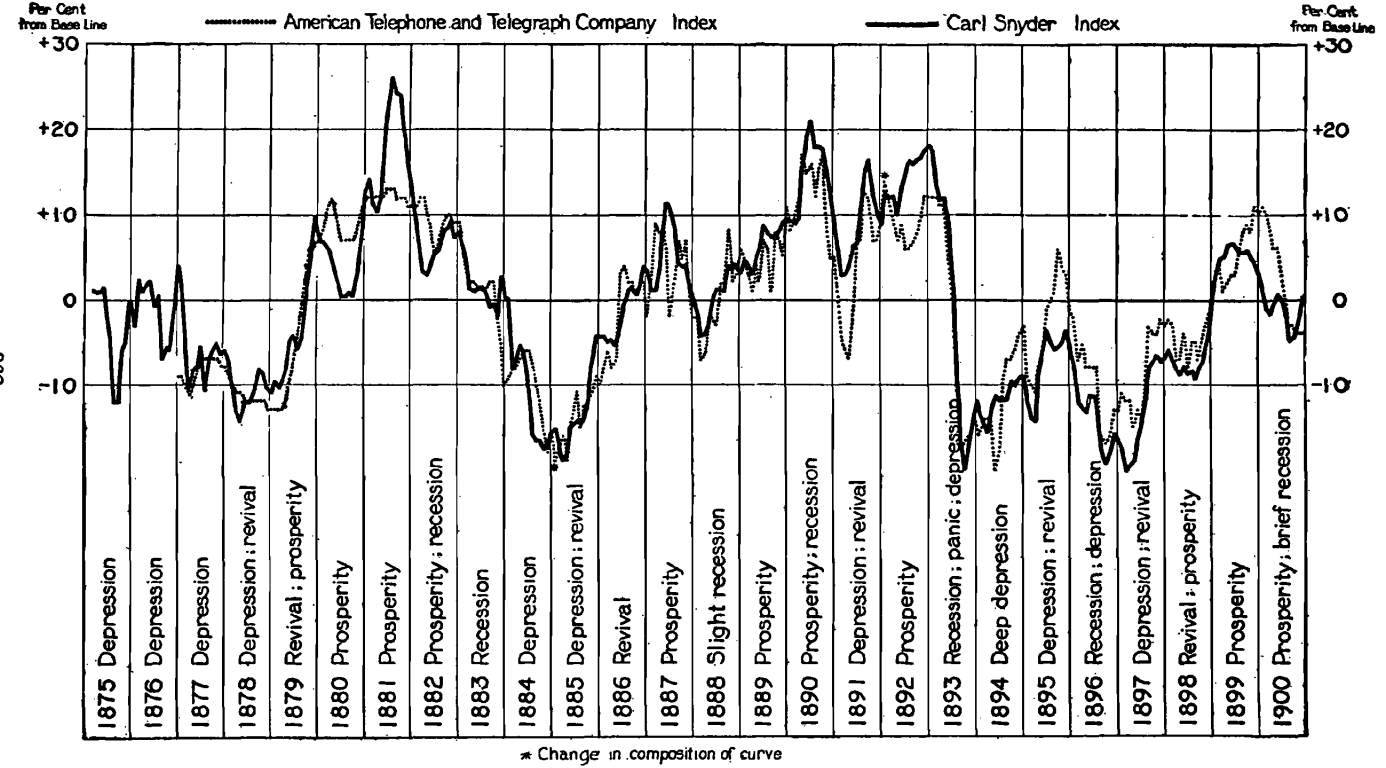
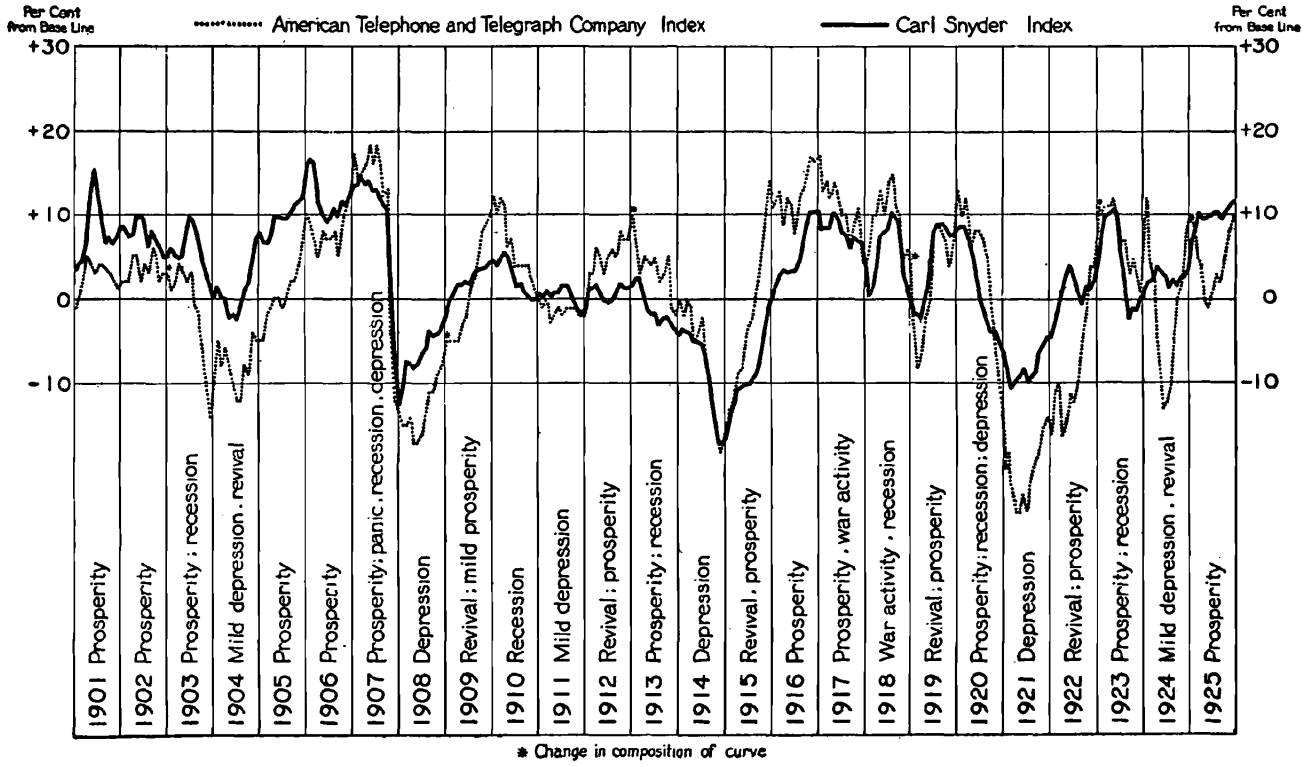


CHART 21. Business Fluctuations in the United States, as shown by the Annals and by Two Statistical Indexes, 1875-1925.—(*Continued*)



the time series used (corrected when necessary for seasonal variations). Since these ordinates are assigned the value of zero or 100 in the computations, they fall in the chart upon a horizontal line, which may be called the base.

In studying the charts, we must bear in mind that they do not do full justice either to the statistical method of presenting changes in business or to the annals. It is a commonplace that no statistical average represents adequately the array of data from which it is computed. Just so, the catchwords used to summarize the annals do not represent adequately Dr. Thorp's records. Much more than the charts show can be learned by examining the series combined to make the indexes of business conditions, and by reading the fuller form of the annals. In confining our comparison to the most abstract and symbolic summaries of the two sets of materials, we are imposing a severe test of conformity.

On the American chart the correspondence between the annals and the two statistical indexes is very close. Indeed, there are no serious discrepancies. To be more specific, the annals show 13 business recessions, mild or severe, between 1875 and 1924. Every one of these recessions is marked in both of the statistical indexes by a decline in the curve. These declines are slight in the recessions which the annals describe as mild, and abrupt in the recessions which the annals (in their fuller form) describe as crises or panics.[2] Further, the two curves give joint evidence of no recessions other than those mentioned by the annals. Similarly with other phases of the successive cycles. When the annals report revivals the curves ascend; when the annals report prosperity the curves fluctuate on levels decidedly higher than in the preceding or following depressions; when the annals report depressions the curves are relatively low

The chief difference between the two records is that the annals show but vaguely and irregularly the degrees of prosperity and depression attained in successive cycles, whereas the curves necessarily deviate from the horizontal base by definite distances. Finally, there are indications in the American chart that business commentators are influenced in their use of the terms prosperity and depression by recent experience. From such subjective waverings, the statistical indexes are exempt. But this point comes out more clearly in the British chart, and will be discussed in that connection.

[2] On the use of these three terms in the annals to suggest the varying character of the transitions from prosperity to depression, see below, section iii, 4, "Crises" and "Recessions."

For opportunity to compare the British annals with a British index, the National Bureau is indebted to Dr. Dorothy Swaine Thomas, who generously put at our disposal before publication a series showing changes in business conditions from 1855 to 1913 by quarters.[3] This index, like the American Telephone and Telegraph Company's index for the United States, is a composite made from a list of series which reflect various types of economic activity. Since these materials have grown more abundant with the years, Dr. Thomas' index represents British business as a whole more faithfully in the later decades than in the earlier ones. But of course the introduction of a new series with a numerical value different from the average of the other components of the index produces changes which may not correspond with the changes in business conditions.

On the whole, the correspondence between the British annals and the British index is close, though not so close as in the American comparison. Dr. Thomas' curve usually rises when the annals report revival, stands high when the annals report prosperity, sinks when the annals report recession, and runs on a low level when the annals report depression. But there are exceptions to the rule which require comment.

(1) Judging from the curve, one would expect the annals to report a recession of British business in 1860-61. These years present an unusually mixed state of affairs. As a result of the American Civil War, the cotton textile industry suffered severely from scarcity of raw material. But reports from other trades do not indicate that there was a general recession of activity. On the contrary, most industries seem to have been very active. In the fuller form of the annals these facts are succinctly stated. For his two-word summary Dr. Thorp could find no phrase which seemed more accurate than "uneven prosperity," a phrase which he uses in all cases when most industries are thriving, but one or more important trades are depressed by special circumstances. The statistics available to Dr. Thomas for the 1860's are data in which the cotton industry counts heavily. Hence her curve drops abruptly. Most of the other English series covering these years which the National Bureau has collected confirm the index rather than the business commentators. In our later statistical work we shall have to recognize the cycles which the consensus of statistical evidence shows. But it would be conceal-

[3] See "An Index of British Business Cycles," by Dorothy S. Thomas, *Journal of the American Statistical Association*, March, 1926, vol. xxi, pp. 60-63.

CHART 22. Business Fluctuations in England, as shown by the Annals and Dr. Dorothy S. Thomas' "Quarterly Index of British Cycles," 1855-1914.

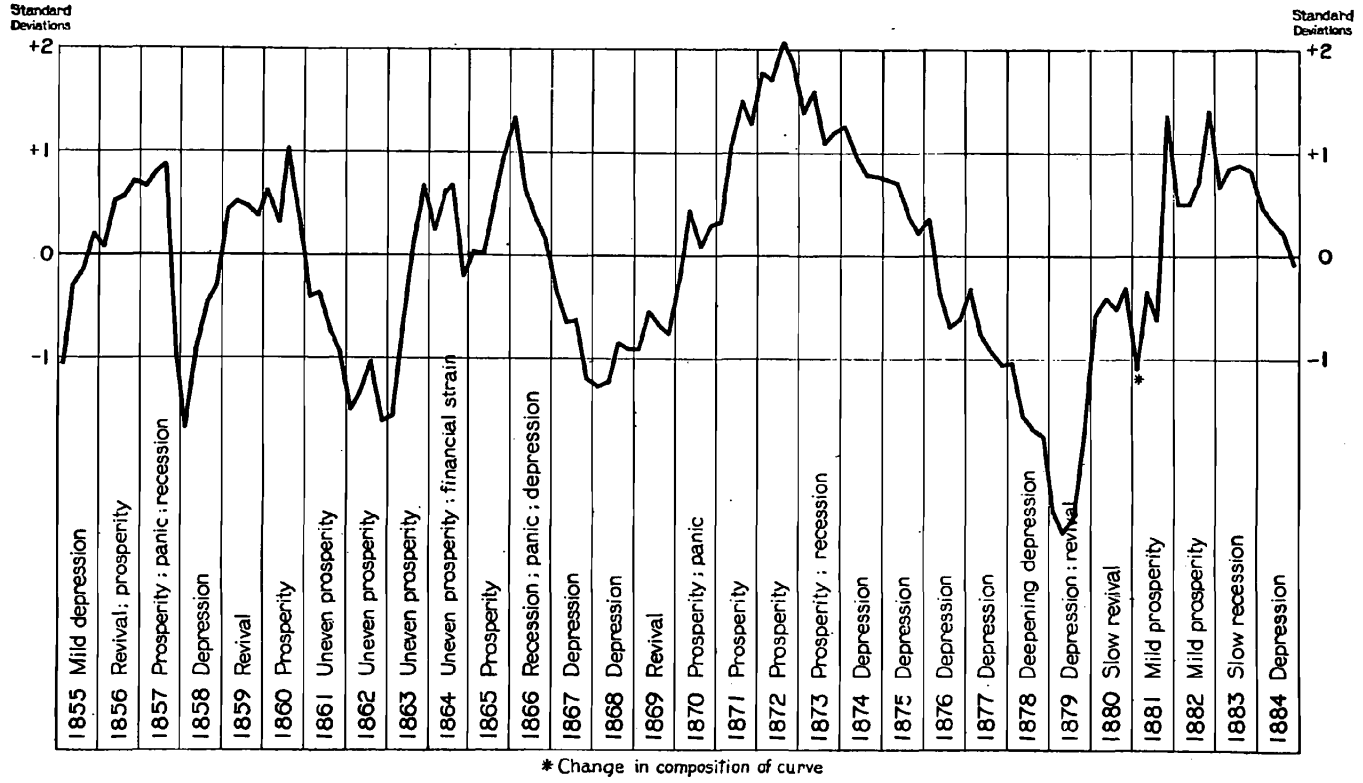
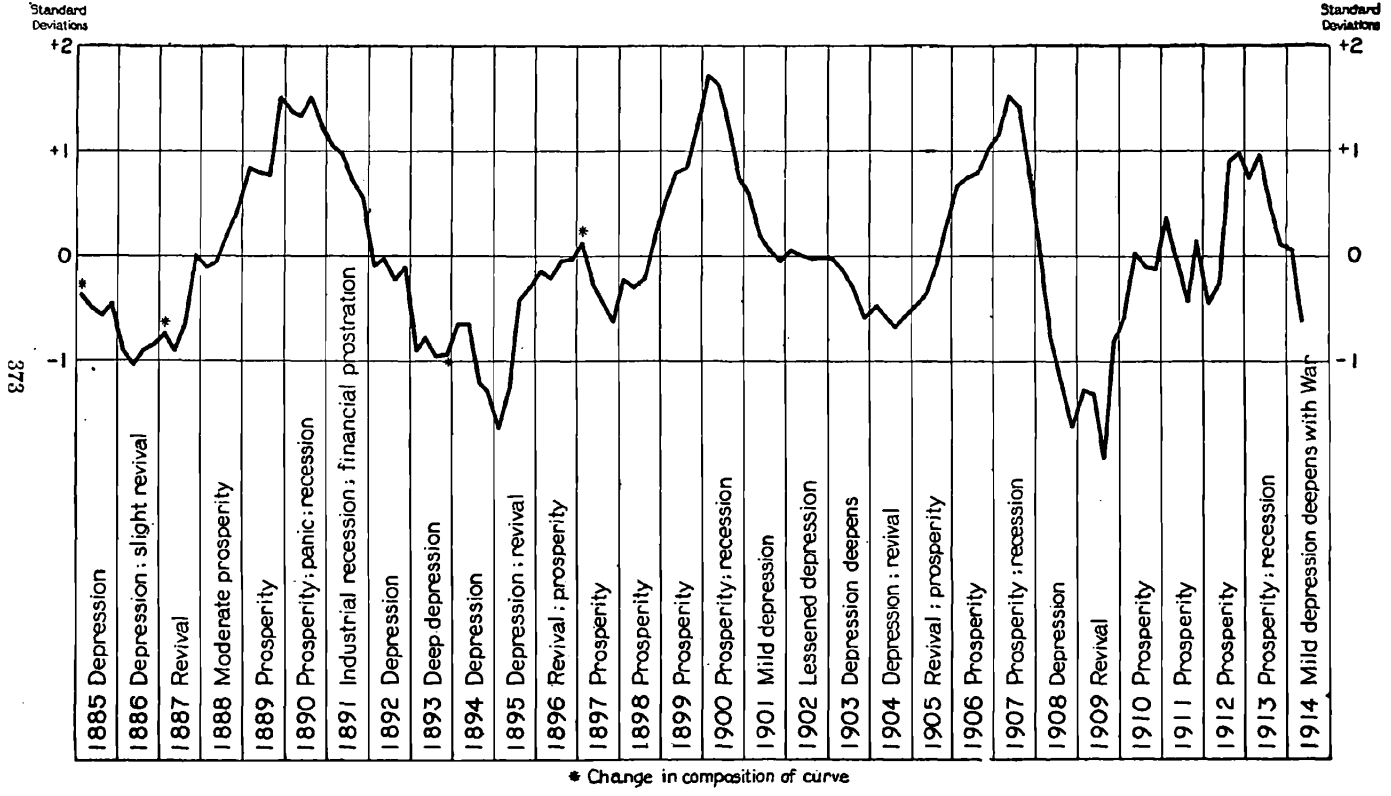


CHART 22. Business Fluctuations in England, as shown by the Annals and Dr. Dorothy S. Thomas' "Quarterly Index of British Cycles," 1855-1914.—(*Continued*)



ing, rather than overcoming, a difficulty to make our interpretation of contemporary opinions fit the surviving figures.

(2) In 1874-75 the annals report depression while Dr. Thomas' curve, though declining, is still above the base line. In 1881, 1897-98 and 1910-11 the annals report "mild prosperity" or "prosperity," while Dr. Thomas' curve is slightly below or but slightly above the base line. Perhaps these differences between the statistical record and the annals are due in part to defects in the data at Dr. Thomas' disposal, or to the technical difficulties of eliminating secular trends. But it is probable that they indicate one of the defects characteristic of business annals. In judging current business conditions, everyone is influenced by comparisons with recent experience. When business has been notably good for several years, as it had been in England during the early 1870's, and then grows slack, a commentator will say that business is depressed, though the volume of trade still remains large. Similarly, after business has passed through a period of hard times, commentators are likely to hail as prosperity any substantial increase of activity. In short, men's judgments upon business conditions belong among the social phenomena which are influenced by business cycles. As a summary of current opinion about the state of trade, our annals reflect these subjective changes in the use of terms.

The preceding comparisons cover periods and countries in which business reporting is well developed. Presumably the annals for earlier years in the United States and England, and the annals for countries with a less integrated organization, contain a wider margin of error. But usually there is such a consensus of judgment among the sources as to leave little doubt about the general tenor of affairs. In years when differences of opinion appear among contemporary writers, Dr. Thorp has consulted every source available to him and has weighed the evidence with care. He has endeavored also to use the technical terms employed in characterizing different states of business as consistently as possible. Yet the results are subject to emendation, and readers who discover errors of any sort are urged to let the National Bureau of Economic Research benefit by their acumen.

Despite the difficulties dwelt upon in the preceding chapter, the most satisfactory materials for studying business cycles are statistical data—not mere business indexes, like those shown in the preceding

charts, but series showing month by month the fluctuations of many types of economic activity. But we have found that the periods and the places for which such data can be had in abundance are few. Hence we have been forced to recognize that narrow limits of time and of space are drawn around the quantitative study of business fluctuations. We cannot trace back business cycles to their beginnings in any country of Europe by the aid of figures. Nor can we trace in figures the spread of business cycles to countries which are just beginning to standardize their economic life on the European pattern. For the compilation of abundant statistics of business activities does not begin in any country until the business activities themselves have become highly organized. That comes later than business cycles.

According to the logic of the statistical method, this limitation of the number of cycles for which data have been preserved is most serious. The statistician's art, as practiced in the social sciences, consists in establishing generalizations about variable phenomena by the analysis of an array of cases. When his cases are few, no elaboration of technique can enable the statistician to generalize with security. Business cycles are both highly complex and highly variable phenomena, and statistical inferences concerning them must be taken as tentative until the number of cases available for analysis has grown decidedly larger than at present.

Under these circumstances it is well to learn all that we can from the annals of business. In countries like the United States and England these annals cover at least twice as many cycles as are covered by more than a few statistical series. In countries where statistics are in their infancy, the annals give us some insight into the course of developments. Precision, of course, cannot be had from descriptive accounts; but the annals speak in terms of more and less, they mark off turning points in business trends, they compare in general terms the contemporary fortunes of different countries. Taken, not as a rival, but as a supplement of statistical analysis, an attempt to find the characteristics of business cycles as shown by the longer and wider record of the annals has its value. Indeed, as was said near the close of the preceding chapter, there are certain fundamental problems concerning business cycles which can be answered more certainly by studying the annals than by analyzing the statistics now available.

## III. The Cyclical Character of Business Fluctuations.

### 1. The "Normal State of Trade" a Figment.

The broadest conclusion established by the long and wide experience covered by the annals is that there is no "normal state of trade." The phrase is common both in treatises upon economic theory and in the talk of business men. Yet the historical record shows no reality corresponding to this figment of the imagination.

If "normal" is interpreted to mean usual, prevailing, that which exists in the absence of grave "disturbing causes," the annals show that the only normal condition is a state of change—which is not what the phrase means to those who use it. From England in 1790 to China in 1925, from Sweden to Australia, the tables reveal incessant fluctuations. Frequently the word "prosperity" is used in the annals of some country for several years in succession. But "depression" occurs in series perhaps as often. And in a less condensed summary both of these catchwords would be qualified always, as they often are qualified even in these tables, by adjectives indicating that the prosperity or depression is waxing or waning.

If "normal" means, not that which usually does prevail, but that which we think should prevail, it is equally a figment—though one of a useful kind. There are good reasons for trying to decide what phase of business cycles is most conducive to social welfare; for seeking ways to make that phase last longer and to mitigate departures from it. But when such is the meaning in mind, a less ambiguous word than "normal" should be used.

Of course, the economic theorist's "normal state," that which corresponds to the conditions assumed for purposes of analysis, is not to be looked for in an historical record. Nor can we take for granted the existence of a moving "normal state of trade," of such a nature that departures from it tend to correct themselves. That idea, if needed, can be less ambiguously expressed in terms of economic equilibria.

An additional source of confusion and therefore an additional reason for avoiding the word is supplied by the slipshod practice of business-cycle statisticians, who sometimes write "normal" when they mean a long-period average, and sometimes write "normal" when they mean the course marked by the ordinates of a secular trend.

## 2. Use of the Term "Cycles."

While the annals show that business is subject to continual fluctuations, they also show that in no country are the alternations of expansion and contraction highly regular. Is it justifiable, then, to speak of these fluctuations as business "cycles"?

That of course is a question regarding the proper use of a technical term. In 1922, President John C. Merriam of the Carnegie Institution called "A Conference on Cycles," in which representatives of several sciences discussed the cyclical phenomena with which they deal. To prevent misunderstandings the conferees needed a definition of cycles applicable alike in meteorology, botany, geology, paleontology, astronomy, geography and economics. Subsequent discussion showed that the definition given by the first speaker, Dr. F. E. Clements, commended itself to the others.

> In general scientific use (said Dr Clements) the word (cycle) denotes a recurrence of different phases of plus and minus departures, which are often susceptible of exact measurement. It has no necessary relation to a definite time interval, though this is frequently a characteristic of astronomical cycles. Apart from the familiar cycles of the day, the lunar month, and the year, the one best known is the sun-spot recurrence, to which the term cycle is almost universally applied. This furnishes convincing evidence that the significance of the term resides in the fact of recurrence rather than in that of the time interval, since the sun-spot cycle has varied in length from 7 to 17 years since 1788, while the minimum-maximum phase has ranged from 3 to 5 years and the maximum-minimum phase from 6 to 8 years since 1833. In consequence, it seems desirable to use cycle as the inclusive term for all recurrences that lend themselves to measurement, and period or periodicity for those with a definite time interval, recognizing, however, that there is no fixed line between the two.[1]

Now our annals show beyond doubt "a recurrence of different phases" in business activity, and these recurrences "lend themselves to measurement." Hence we have ample warrant in the usages of other sciences than economics for applying the term "cycles" to

[1] "Report of a Conference on Cycles," *The Geographical Review*, Special Supplement, October, 1923, vol. xiii, pp. 657, 658.

business fluctuations. But the term "periodicity" we should not use with reference to business cycles, or with reference to crises. For the time intervals between crises are far from regular. They vary, as will appear presently, even more than the length of sun-spot cycles.

### 3. The Phases of Business Cycles.

The different phases which recur in business activity are sometimes treated as only two—depression and prosperity. More often there are said to be three phases which recur in the order prosperity, crisis, depression.[1] But if the transition from prosperity to depression is recognized as a separate phase, it seems logical to give similar recognition to the transition from depression to prosperity. Then we have a four-phase cycle of prosperity, crisis, depression, and revival.[2] Professor Warren M. Persons goes further still. By dividing the transition from prosperity to depression into "financial strain" and "industrial crisis," he gets five phases.[3]

This process of subdivision can be carried further indefinitely as statistics with brief time intervals become more abundant. And as knowledge of the subject grows and its practical applications become more important, there may be call for such refinements. As matters stand, however, four phases satisfy the needs of systematic inquiry. The separation of the phase of "financial strain" from that of "industrial crisis" rests on logical quite as much as upon chronological grounds, and is somewhat confusing in a cycle of recurrence in time. Cases will be cited presently of financial strain occurring at other stages of the cycle than the transition from prosperity to depression, and industrial reactions frequently occur when it is difficult to find any trace of preceding financial strain, for example, in the United States in 1923. But we are trenching upon a topic which requires separate treatment.

### 4. "Crises" and "Recessions."

Two quite distinct conceptions of business crises are current in recent books. Professor Aftalion, for example, defines the crisis as

[1] Compare for example, Dr. E. H. Vogel's description of a cycle, *Die Theorie des volkswirtschaftlichen Entwickelungsprozesses und das Krisenproblem*, Vienna, 1917, pp. 31, 32.

[2] These four phases were recognized and separately described as long ago as 1867 by John Mills, "On Credit Cycles, and the Origin of Commercial Panics," *Transactions of the Manchester Statistical Society*, 1867-68, pp. 5-40.

[3] See Professor Persons' numerous articles in the *Review of Economic Statistics*, and his *Measuring and Forecasting General Business Conditions*, New York, 1920, p. 34.

"the point of intersection . . . at which prosperity passes over into depression." [1] Professor Bouniatian, to give a corresponding example of the second usage, applies the term "to an organic disturbance of economic life, bringing upon a large number of enterprisers loss of fortune and income or complete economic ruin." [2]

From this difference of definition there follow differences in the lists of crises recognized in various books, and hence differences in the average intervals asserted to lie between crises. Professor Lescure, who antedated Aftalion in defining crisis as the point of intersection between prosperity and depression, includes the crisis of 1913 in his historical section. But Bouniatian admits no crisis between 1907 and 1920, and quite consistently; for, as Lescure himself explains, there was no epidemic of bankruptcies in 1913.[3] Tugan-Baranovski goes even further than Bouniatian in stressing the violence of crises, and consequently in shortening his list of crisis dates. A crisis "breaks out like a tempest" in the midst of prosperity, "bringing bankruptcies, unemployment, misery, etc." With this conception in mind, he quite rightly says that England escaped a crisis in 1873, in 1882, in 1890, in 1900 and in 1907—though the "industrial cycle" shows itself in the evolution of English business in these later times "with the same neatness and clarity as before." [4]

Which of these two conceptions of the crisis fits better in a discussion of business cycles is easy to decide. What concerns such a discussion is the recurrence of certain phases of business activity. The transition from prosperity to depression is one of the regularly recurring phases, whether it is marked by "an organic disturbance of economic life," in Bouniatian's phrase, or whether financial strain is conspicuous by its absence.

But while there is no doubt about the reality of these transitions, there is grave doubt whether the word crisis should be retained to describe them. For with that word there is associated in the public mind, as in the minds of writers like Bouniatian and Tugan-Baranovski, the idea of financial strain. When such strain is scarcely perceptible, it is confusing to call the transition a crisis. Close study of the annals shows that transitions free from strain are frequent—

[1] Albert Aftalion, *Les Crises Périodiques de Surproduction*, Paris, 1913, vol. i, Preface, p. vi.

[2] Mentor Bouniatian, *Les Crises Économiques*, Paris, 1922, p. 31.

[3] Lescure, *Des Crises Générales et Périodiques de Surproduction*, 3rd ed., Paris, 1923, pp. 2 and 238-253; Bouniatian, as cited above, pp. 43, 44.

[4] Michel Tugan-Baranovski, *Les Crises Industrielles en Angleterre*, Paris, 1913, pp. 34, 150, 152, 166, 167, 174.

perhaps more frequent than violent transitions. And there are cheering indications that the preponderance of mild transitions is growing greater.

To make the confusion worse, the annals report numerous cases of financial strain, not at the moment when prosperity is passing into depression, but in other phases of the cycle. "Financial stringency" and "bourse panics" are common phenomena in "booms," often occurring a year or two before the phase of expansion in general business ends Less remembered, but not less important, are the cases of financial strain coming in periods of depression. To cite a dozen examples, the annals make such reports for France in 1861, Germany in 1877, England in 1878, Argentina in 1891, Australia and Russia in 1892, Italy and the Netherlands in 1893, the United States in 1896 (as well as in 1819 and 1884), South Africa in 1898, Japan in 1901, and China in 1912. Often the sources from which the annals are drawn use the words "crisis" or "panic" in describing these episodes of depression, and sometimes they use "crisis" as equivalent to depression itself.

"Crisis," then, is a poor term to use in describing one of the four phases of business cycles. If it is to be retained, it must be defined in the colorless fashion of Lescure and Aftalion—as the mere point of intersection between prosperity and depression. But sad experience shows how much misunderstanding comes from the effort to use familiar words in new technical senses. Scientific writers can hardly expect that readers will purge their minds of old associations and form new ones at a terminologist's bidding.

One remedy for the ambiguity of "crisis" is to apply a qualifying adjective whenever the word is used. Thus Mr. Joseph Kitchin distinguishes between major and minor crises. But his major crises are in some cases such mild transitions that many writers refuse to call them crises at all. Such is the case with the American crises of 1882 and 1899 (1900 is a better date), and the English crisis of 1913, all of which Mr. Kitchin labels "major." [5] Thus his conception of a major crisis is even more confusing to non-technical readers than the use of the unqualified term. If the ambiguity is to be remedied by applying adjectives, it seems best to use a pair that bear directly upon the ambiguous point. Thus the common expressions "mild crisis" and "severe crisis" are clear in intent and safe

[5] See the "Dates of Major Crises" in Mr. Kitchin's paper, "Cycles and Trends in Economic Factors," *Review of Economic Statistics*, January, 1923, Prel. vol. v, pp. 10-16.

to use in descriptive work, such as business annals, provided there are not too many cases on the borderline between mildness and severity.

But no set of adjectives can make "crisis" a suitable name for the fourth phase of business cycles. Hardly can one say "depression, revival, prosperity, mild or severe crisis." The choice lies between retaining "crisis" defined in an unfamiliar way, or replacing it by some word corresponding to "revival," which is used to designate the upward turn of the cycle. This second alternative seems the lesser evil, especially in view of the fact that our theoretical and practical interests lie increasingly in those mild transitions from prosperity to depression which have been little attended to by theorists.

In this discussion, accordingly, business cycles are treated as having four phases—depression, revival, prosperity and recession. The word "crisis" is not dropped, but is used like the words "panic" or "boom" to indicate degrees of intensity. Every business cycle includes a phase of recession; this recession may or may not be marked by a crisis; the crisis, if there is one, may or may not degenerate into a panic. All the old and most of the recent books on the subject deal chiefly with crises, panics and severe depressions; these annals endeavor to show also the mild recessions and the periods of dull business.

We have, indeed, gone far—we hope not too far—in calling attention to the mild recessions. Our aim has been to include all cases in which the evidence indicates a general slackening of activity, even though the slackening lasted but a few months, and did not reach grave proportions. Cases in point may be found in the American annals for 1888, 1900 and 1923. Other illustrations are Italy in 1900, England in 1803 and 1854, and the brief reaction in the majority of our 17 countries after the Armistice of 1918. On the other hand, we have tried not to include cases in which only a few branches of business suffered a setback—such as the English case of 1860-61 already referred to, or the financial difficulties caused in London by the outbreak of war between France and Prussia in 1870.

### 5. "Prosperity" and "Depression."

A somewhat different criticism may be made of the terms used for two other phases of business cycles. In comparing the annals with business indexes, we had occasion to note that the words "pros-

perity" and "depression" are themselves subject to cyclical fluctuations in meaning. Their significance is relative rather than fixed. The more active phase of a given cycle is called prosperous, and the less active phase is called depressed, though both phases may be very mild. We must not suppose that business conditions are almost identical in the prosperous phases of successive cycles, even in the same country—or in the depressed phases.

This relativity of meaning appeared in the review of business indexes in Chapter III, though little was said about it at the time. The crests of business cycles sometimes reach but a little way above the base lines of the index charts. On rare occasions they remain below these lines. The like is true, *mutatis mutandis,* of the troughs. Statistically, prosperity and depression are variables, distributed in a fairly regular fashion over a considerable range.[1]

Perhaps we might develop quantitative definitions for prosperity and depression by saying, for example, that business is prosperous when certain indexes have attained a given percentage height above their corrected trends. The time may come when that shift in practice will appear both feasible and desirable. Or we might substitute for the words in question other terms whose relativity of meaning is patent. For example, we might speak of the phase of business expansion and the phase of business contraction, or of the phase of rising and declining activity. Of course these two proposals are quite compatible with each other. But our business indexes are not yet sufficiently perfect, and they do not yet cover a sufficient range of times and places, to afford satisfactory measurements of degree of prosperity and depression. The second proposal presents no such difficulties, and is often followed in this discussion. Yet the misunderstandings to which the words in question may give rise seem scarcely grave enough to justify discarding them entirely. Few people are likely to think of prosperity and depression as definite states. When their application to business cycles involves a serious stretching of the vague popular usage, a reminder of their technical meaning may be sufficient safeguard.

### 6. The Uniformity and the Variability of Business Cycles.

Recurrence of depression, revival, prosperity and recession, time after time in land after land, may be the chief conclusion drawn from

[1] See Chapter III, section vi, 3 (3) "On Identifying Business Cycles by the Use of the Business Indexes," and (7) "The Amplitudes of Business Cycles."

the experience packed into our annals; but a second conclusion is that no two recurrences in all the array seem precisely alike. Business cycles differ in their duration as wholes and in the relative duration of their component phases; they differ in industrial and geographical scope; they differ in intensity; they differ in the features which attain prominence; they differ in the quickness and the uniformity with which they sweep from one country to another.

This mixture of uniformity and variability in business cycles may seem disconcerting when stated so baldly. But we confront a similar mixture of fundamental similarity and detailed differences when we visualize men's faces, or consider their characters, or study any social phenomena. In all such cases, variability presents conceptual difficulties not to be glossed over, and difficulties of explanation not surmounted as yet. But uncounted ages ago men found that they could think of pines despite difference in the size, shape, location, color, roughness, and hardness of particular specimens; they could think of trees despite the differences among pines, maples and palms, and the difficulty of delimiting trees from shrubs. And within the past hundred years men have developed a technique for studying variations about a central tendency, a technique which reveals the existence of formerly unsuspected uniformities among variations themselves.

Differences among business cycles, then, afford no reason for doubting that these cycles constitute a valid species of phenomena. But the existence of such differences should put us on our guard against using concepts and methods of analysis appropriate only in work where differences among individuals of a given species either do not exist or can be precisely defined (as in geometry), or are not significant for the problems under consideration (as in certain branches of physics and chemistry). The student of business cycles should picture their characteristic differences as clearly as may be, measure them with what precision he can, and find how these differences are distributed around their central tendencies. While the annals are not quantitative in form, they can be used to some extent in treating this statistical problem.

## IV. The Duration of Business Cycles.

### 1. Current Estimates of Average Length.

The differences among business cycles which have attracted most attention are differences in duration. Quite naturally, the discoverers

of the recurrence overstressed its uniformity in this respect as in others. Influenced by the dominant type of economic theory, these discoverers thought of a "normal" cycle and so simplified their problem—a practice still common. To cite an extreme example: in 1867 John Mills described the "credit cycle" as lasting ten years—three years of declining trade, three years of increasing trade, three years of over-excited trade, and one year of crisis.[1] Even the early statistical workers yielded to the lure of "normality." They were eager to establish the "periodicity of crises," which was suggested by such crisis dates as 1815, 1825, 1836, 1847, 1857 and 1866. This desire warped their selection and treatment of data. Jevons had an admirably candid mind; yet in 1875, when the sun-spot cycle was supposed to last 11.1 years, he was able to get from Thorold Rogers' *History of Agriculture and Prices in England* a period of 11 years in price fluctuations, and when the sun-spot cycle was revised to 10.45 years he was able to make the average interval between English crises 10.466 years.[2] To get this later result, Jevons purposely left out from his list of crises "a great commercial collapse in 1810-11 (which will not fit into the decennial series)"; he also omitted the crisis of 1873, and inserted a crisis in 1878, which other writers do not find.[3]

Jevons' way of reckoning the length of cycles by the intervals between crises, and of counting as crises periods of financial strain coming after booms, or recessions followed by long depressions, is still common among theoretical writers. The results they get are not in close agreement. Tugan-Baranovski takes 7 to 11 years as the limits of variation in the length of cycles and 10 years as the average duration. Bouniatian says that "under normal conditions" cycles last from 9 to 11 years, but adds that there is "a tendency toward a normal period of about 10 years." Cassel takes 1873, 1882, 1890, 1900, and 1907 as crisis years in Europe, and 1873, 1882, 1893, 1903, and 1907 as crisis years in the United States. Cassel himself strikes no average, but his dates give limits of 4 to 11 years and an average of 8½ years. Lavington accepts 8 years as the average duration.

[1] "On Credit Cycles and the Origin of Commercial Panics," *Transactions of the Manchester Statistical Society*, 1867-68, pp. 5-40. Compare the diagram of a cycle which Jevons gives in his *Primer of Political Economy*, New York, 1882, p. 121.

[2] Jevons withdrew his first paper from publication when he discovered "that periods of 3, 5, 7, 9, or even 13 years would agree with Professor Rogers' data just as well as a period of 11 years." See his *Investigations in Currency and Finance*, London, 1884, pp. 207, 225.

[3] See the three papers on crises reprinted in Jevons' *Investigations in Currency and Finance*, especially pp. 200-203, 225, 233.

Slightly different is the method of reckoning cycles by the intervals between depressions. Otto C. Lightner records 18 depressions in American business from 1808 to 1921, not counting "minor" cases, with intervals ranging from 3 to 12 years and averaging 6⅔ years. George H. Hull, denying that depressions are periodic, counts 17 "industrial crises" in the United States from 1814 to 1907. His dates differ somewhat from Lightner's, having intervals ranging from 1 to 11 years, and averaging a little less than 6 years apart.

With these results may be given two others of the same order of magnitude, but reached by quite different methods. Pigou, using British unemployment returns and measuring intervals between both the crests and the troughs of the industrial waves, gets a trifle less than 8 years as his average length. Henry L. Moore also gets 8 years as the standard length both of "generating" and of "derived economic cycles," but gets it from periodogram analysis of time-series.[4]

Other statistical workers have recently reached quite different conclusions. Thus Professor W. L. Crum made a periodogram analysis of monthly interest rates upon commercial paper in New York from 1866 to 1922 and found (somewhat doubtful) evidence of a period of 39-40 months in their fluctuations. At the same time Mr. Joseph Kitchin, after analyzing bank clearings, interest rates, and wholesale prices in Great Britain and the United States from 1890 to 1922, suggested that the cyclical fluctuations of trade are composed of minor cycles averaging 40 months in length, and major cycles, which are aggregates of two or less often, of three minor cycles.[5] Since the publication of these two papers in January, 1923, "the 40-month cycle" has enjoyed a considerable vogue among statisticians. Forty months is also the median value of the observations upon the duration of American cycles in 1878-1923, derived in Chapter III from five indexes of business conditions, while the mean value is 42 months.

[4] See M. Tugan-Baranovski, *Les Crises Industrielles en Angleterre*, 1913, pp. 247, 248; M. Bouniatian, *Les Crises Économiques*, 1922, p. 42; G. Cassel, *The Theory of Social Economy*, 1924, p. 508; A. Aftalion, *Les Crises Périodiques de Surproduction*, 1913, vol. i, pp. 8-14; F. Lavington, *The Trade Cycle*, 1922, p. 14; O. C. Lightner, *History of Business Depressions*, 1922, table of contents; G. H. Hull, *Industrial Depressions*, 1911, pp. 54-57, and the chronological table, pp. 50, 51; A. C. Pigou, *The Economics of Welfare*, 1920, p. 804; Henry L. Moore, *Generating Economic Cycles*, 1923, pp. 15, 64.

[5] See W. L. Crum, "Cycles of Rates on Commercial Paper," *Review of Economic Statistics*, January, 1923, preliminary vol. v, pp. 17-28; Joseph Kitchin, "Cycles and Trends in Economic Factors," the same, pp. 10-16.

### 2. Measurements Based upon the Annals.

It is not necessary to examine narrowly the discrepancies among the results obtained by measuring the intervals between years of crisis or years of depression. They run back partly to differences in the countries and the periods covered, and partly to differences of opinion concerning the severity which entitles a particular disturbance to be called a true crisis or depression. Granted each author his own conception of what constitutes a cycle, his measurements are presumably correct for the land and period covered. By using the present annals, anyone so disposed might validate, and anyone so disposed might question any of the averages and limits of variations which have been derived in this way.

But anyone who reads the annals closely, whatever the definition of crisis in his mind, will see that there is grave question regarding the unity of many of the 6-, or 8-, or 10-year cycles. Take as the simplest example Professor Cassel's list of crisis years in the United States: 1873, 1882, 1893, 1903 and 1907. Perhaps one may argue that the annals justify these dates from Cassel's viewpoint, though it is not clear why he should omit 1888 if he includes 1903. But the important point is that the cycle from 1882 to 1893 was punctuated by the recessions of 1888 and 1890, and that the cycle from 1893 to 1903 was punctuated by recessions both in 1896 and in 1900.

Now, the differences of opinion concerning the length of American cycles in this period turn less on the facts of business expansion and contraction than on what movements of expansion and contraction should be selected for treatment as business cycles. The older writers fastened upon the salient phenomena—severe crises and the rather long intervals between them—as requiring explanation. This tradition still rules in theoretical treatises. But as knowledge of business cycles grows, and as men seek to use this knowledge more effectively in interpreting current developments month by month, a more intensive treatment becomes both feasible and useful. Without denying the graver importance of the wider swings, we find ourselves involved much of the time in dealing with fluctuations of less amplitude, fluctuations which the theorists have passed over lightly. The same developments which make it wise to substitute the concept of recession for the concept of crisis make it wise to recognize the shorter segments into which the long swings are frequently divisible.

This change reduces the typical duration of American cycles to roughly one-half of the estimate commonest among theoretical writers.

By way of illustration, we may compile from the American annals a list of recessions in the United States since 1790. In this list the recessions are characterized by phrases which indicate their severity, and leading features. Financial troubles occurring in the middle of depressions are not counted as recessions, but cases of this sort which have commonly been listed as crises are noted in the table. In the early years the business fortunes of the northern states alone are followed; sometimes conditions were quite different in the agricultural south and west. Since the annals seldom permit a precise dating of recessions, the duration of successive cycles is reckoned to the nearest whole year.

TABLE 23

BUSINESS RECESSIONS IN THE UNITED STATES AND APPROXIMATE DURATION OF BUSINESS CYCLES, 1790–1925

| | | Duration of Cycles in Years |
|---|---|---|
| 1796 * | Financial crisis, spring..... | |
| 1802 | Recession early in year.... | 6 |
| 1807 * | Recession late in year..... | 6 |
| 1812 | Brief recession, June, War with England ..... | 5 |
| 1815 * | Crisis, March, following peace ..... | 3 |
| 1822 | Mild recession, May..... | 7 |
| 1825 * | Panic, autumn ..... | 3 |
| 1828 | Recession, summer ..... | 3 |
| 1833 | Recession, panic, autumn.. | 5 |
| 1837 * | Panic, spring ..... | 4 |
| 1839 * | Panic, October ..... | 3 |
| 1845 | Brief recession, May ..... | 6 |
| 1846 | Mild recession early in year, War with Mexico ..... | 1 |
| 1847 * | Recession, financial panic, November ..... | 2 |
| 1853 | Recession, last quarter.... | 6 |
| 1857 * | Recession, late spring, panic in August ..... | 4 |
| 1860 | Recession late in year, prospect of Civil War ..... | 3 |
| 1865 | Recession, second quarter, close of Civil War ..... | 5 |
| 1870 | Recession, January ..... | 5 |
| 1873 * | Violent panic, September.. | 4 |
| 1882 | Recession late in year, financial panic in 1884 *.... | 9 |
| 1888 | Slight recession, early in year ..... | 5 |
| 1890 | Financial crisis, autumn.... | 3 |
| 1893 * | Severe panic, May..... | 2 |
| 1896 | Recession early in year, financial stringency ..... | 3 |
| 1900 | Brief and slight recession, spring ..... | 4 |
| 1903 * | Financial strain, spring.... | 3 |
| 1907 * | Severe crisis, autumn..... | 4 |
| 1910 | Mild recession, January.... | 2 |
| 1913 * | Recession, summer ..... | 3 |
| 1918 | Recession after Armistice, November ..... | 5 |
| 1920 * | Severe crisis, May ..... | 2 |
| 1923 | Mild recession, summer.... | 3 |

*The dates thus marked show the commonly accepted crisis years. Other dates frequently listed are 1819, a case of financial strain in a business depression, and 1890. The "rich man's panic" of 1903 is omitted in some lists.

To show the usual way of reckoning the length of cycles, the commonly accepted dates of crises in the United States are marked with asterisks. Anyone who checks these dates against those given in other books will find different ways of counting; for example, 1837-1839 is sometimes put down as a single crisis. But, taking the dates as marked, we have 14 cycles between 1796 and 1920, ranging from about 2 years (1837-39) to about 16 years (1857-1873) in length, and averaging 8⅔ years. We can raise this average by omitting or combining some of the crises counted here, or reduce it by counting some of the other recessions as crises. At best there is a considerable margin for admissible difference of opinion.

When we drop the effort to discriminate the degrees of severity among crises and count all recessions, this margin of uncertainty becomes narrower, though it does not vanish. It is easier to recognize a change of direction in business movements than it is to determine how serious a change for the worse has been. Yet, another compiler drawing off a list of recessions from the most detailed form of our annals might give a slightly different set of dates, and one who made a fresh set of annals from the original sources might increase these differences somewhat. The broad results, however, seem well assured.

Counting business cycles now as the intervals between recessions, noting the quarters in which the turns came, and reckoning to the nearest whole year, we get the following results:

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | cycle | about | 1 | year | long | (1845-46) |
| 4 | cycles | " | 2 | years | " | |
| 10 | " | " | 3 | " | " | |
| 5 | " | " | 4 | " | " | |
| 6 | " | " | 5 | " | " | |
| 4 | " | " | 6 | " | " | |
| 1 | " | " | 7 | " | " | (1815-1822) |
| 0 | " | " | 8 | " | " | |
| 1 | " | " | 9 | " | " | (1873-1882) |

In all we have 32 cycles in 127 years, which yields an average length of not quite 4 years. The commonest length is about three years; and two-thirds of the cases fall within the limits of three to five years.

These results may be compared with similar summaries from the other country for which we have annals covering 136 years. The dates given in Bouniatian's list of English crises are starred to

show the conventional view of cycle chronology. His 16 dates mark off 15 cycles in the 127 years from 1793 to 1920—an average length of almost 8½ years. If 1913 be added to the list of crises and it seems to belong there quite as much as certain dates which Bouniatian admits as turning points unaccompanied by severe financial strain, there are 16 cycles, ranging in length from about 4 to about 13 years, and averaging not quite 8 years.

Of the cycles marked off by recessions, 22 are shown. Perhaps we should add recessions in 1814 after the first abdication of Napoleon, in 1861 when the American Civil War upset the cotton trade, in 1864 when financial strain was marked, in 1870 when the Franco-Prussian War brought confusion to the financial markets, in 1897 and 1911 when the rising tides of activity were checked. But in none of these cases does the evidence of contemporary business reports indicate a general slackening of trade. Even if these cases were counted, it would still appear that English business has experienced fewer recessions than American business during the same period of four generations. Hence English cycles have been longer on the average than American cycles. Taking the dates entered in the table we get an average duration of 5¾ years in England against 4 years in the United States.

But these averages are even less a guide to business forecasting in England than in America. It is difficult to find any regular order in the lengths of the successive cycles in either Table 23 or Table 24. When we tabulate the frequency of English cycles according to duration we find less concentration at the mode than in the corresponding American table. From 1793-1920 there were

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | cycles | about | 2 | years | long | (1829-31, and 1918-20) |
| 1 | " | " | 3 | " | " | (1807-10) |
| 5 | " | " | 4 | " | " | |
| 2 | " | " | 5 | " | " | |
| 4 | " | " | 6 | " | " | |
| 2 | " | " | 7 | " | " | |
| 3 | " | " | 8 | " | " | |
| 1 | " | " | 9 | " | " | (1873-83) |
| 2 | " | " | 10 | " | " | (1837-47, and 1890-1900) |

Four-year cycles are most common in England, three-year cycles in the United States. One-half of the English cases are 4-6 years in

length, while two-thirds of the American cases are grouped at 3-5 years.

TABLE 24

BUSINESS RECESSIONS IN ENGLAND AND APPROXIMATE DURATION OF BUSINESS CYCLES, 1790–1925

| | | Duration of Cycles in years |
|---|---|---|
| 1793 | Recession, February, following financial pressure in 1792 * | |
| 1797 * | Panic, February | 4 |
| 1803 | Recession, May, renewal of war | 6 |
| 1807 | Mild recession | 4 |
| 1810 * | Severe crisis, July | 3 |
| 1815 * | Crisis, autumn, following end of war | 5 |
| 1819 * | Recession, early spring | 4 |
| 1825 * | Recession, spring, followed by financial panic | 6 |
| 1829 | Recession, first quarter | 4 |
| 1831 | Recession | 2 |
| 1837 | Recession early in year, following financial panic in 1836 * | 6 |
| 1847 * | Financial panic, April, recession, summer | 10 |
| 1854 | Recession, January, Crimean War | 7 |
| 1857 * | Financial panic, November | 4 |
| 1866 * | Severe financial crisis, first quarter, Overend-Gurney failure | 8 |
| 1873 * | Recession late in year | 8 |
| 1883 | Slow recession, early in year, perhaps beginning in 1882 * | 9 |
| 1890 * | Recession following financial crisis in November | 8 |
| 1900 * | Recession, summer | 10 |
| 1907 * | Recession, autumn, financial stringency | 7 |
| 1913 | Recession, last quarter | 6 |
| 1918 | Recession on Armistice, November | 5 |
| 1920 * | Severe crisis, second quarter | 2 |

*The dates thus marked show the crises recognized by Mentor Bouniatian, *Les Crises Économiques*, Paris, 1922, p. 43. Most authorities would include 1913, also, on the same grounds that lead Bouniatian to list crises in 1882 and 1900, although these years were not marked by severe financial strain.

On applying the same methods of analysis to the three other countries for which we have annals running back to the 1860's, 1850's, and 1840's, we find that in average duration their cycles are intermediate between the English and the American patterns. The average length works out as follows:

1838-1920—82 years

France, 15 cycles, average length 5½ years.

England, (1837-1920), 12 cycles, average length nearly 7 years.

United States, (1837-1920), 22 cycles, average length 3¾ years.

1848-1925—77 years
Germany, 15 cycles, average length 5 years.
England (1847-1920), 11 cycles, average length 6⅔ years.
United States (1847-1923), 19 cycles, average length 4 years.
1866-1922—56 years
Austria, 10 cycles, average length 5.6 years.
England (1866-1920), 8 cycles, average length 6¾ years.
United States (1865-1923), 15 cycles, average length not quite 4 years.

### 3. Frequency Distributions of the Measurements Based upon the Annals.

A systematic summary of our evidence concerning the duration of business cycles is provided by the following exhibits. Table 25 is a companion piece to Tables 23 and 24. It shows the dates of recessions in fifteen countries as accurately as Dr. Thorp can determine them from the annals, and shows also the approximate duration of successive cycles reckoned to the nearest whole year. Chart 23 is a graphic version of Tables 23, 24, and 25. It uses lines of varying length to show the duration of business cycles in each of our countries, in chronological order.

TABLE 25

Dates of Business Recessions in Fifteen Countries: Various Years to 1925

| | | Duration of Cycles in years | | | Duration of Cycles in years | | | Duration of Cycles in years |
|---|---|---|---|---|---|---|---|---|
| | France | | 1900 | late summer | 11 | 1873 | autumn | 3 |
| 1838 | | | 1908 | early | 7 | 1878 | early | 4 |
| 1847 | early | 9 | 1913 | early summer | 5 | 1880 | early | 2 |
| 1854 | March | 7 | 1918 | November | 5 | 1882 | summer | 3 |
| 1857 | autumn | 3 | 1920 | summer | 2 | 1890 | early | 8 |
| 1860 | autumn | 3 | | | | 1900 | August | 10 |
| 1867 | early | 6 | | | | 1904 | summer | 4 |
| 1870 | July | 3 | | Germany | | 1907 | summer | 3 |
| 1873 | early | 3 | 1848 | | | 1913 | summer | 6 |
| 1876 | early | 3 | 1857 | autumn | 9 | 1918 | November | 5 |
| 1882 | early | 6 | 1866 | June | 9 | 1922 | summer | 4 |
| 1890 | early | 8 | 1870 | July | 4 | 1925 | summer | 3 |

TABLE 25—(*Continued*)

DATES OF BUSINESS RECESSIONS IN FIFTEEN COUNTRIES

| | | Duration of Cycles in years |
|---|---|---|
| | **Austria** | |
| 1866 | | |
| 1869 | late | 3 |
| 1873 | summer | 4 |
| 1884 | early | 11 |
| 1892 | early | 8 |
| 1894 | early | 2 |
| 1900 | early | 6 |
| 1908 | early | 8 |
| 1912 | autumn | 5 |
| 1918 | October | 6 |
| 1922 | autumn | 4 |
| | **Russia** | |
| 1891 | early | |
| 1899 | third quarter. | 8 |
| 1904 | February | 5 |
| 1908 | early | 4 |
| 1914 | early | 6 |
| 1917 | March | 3 |
| 1923 | October | 7 |
| 1925 | late | 2 |
| | **Sweden** | |
| 1892 | early | |
| 1901 | early | 9 |
| 1907 | late autumn.. | 7 |
| 1913 | autumn | 6 |
| 1917 | | 4 |
| 1920 | summer | 3 |
| | **Netherlands** | |
| 1891 | early | |
| 1901 | early | 10 |
| 1907 | autumn | 7 |
| 1913 | late | 6 |
| 1917 | early | 3 |
| 1920 | autumn | 4 |
| | **Italy** | |
| 1888 | early | |
| 1900 | spring | 12 |
| 1907 | last quarter .. | 8 |
| 1913 | second half... | 6 |
| 1918 | October | 5 |
| 1920 | early | 1 |
| | **Argentina** | |
| 1890 | first quarter | |
| 1892 | autumn | 3 |
| 1900 | early | 7 |
| 1908 | early | 8 |
| 1911 | early | 3 |
| 1913 | early | 2 |
| 1920 | December | 8 |
| | **Brazil** | |
| 1889 | November | |
| 1896 | early | 6 |
| 1900 | autumn | 5 |
| 1907 | autumn | 7 |
| 1912 | late | 5 |
| 1918 | November | 6 |
| 1920 | autumn | 2 |
| 1924 | second half | 4 |
| | **Canada** | |
| 1888 | | |
| 1893 | early | 5 |
| 1900 | autumn | 7 |
| 1907 | autumn | 7 |
| 1913 | second half .. | 6 |
| 1918 | November | 5 |
| 1920 | autumn | 2 |
| 1924 | spring | 4 |
| | **South Africa** | |
| 1890 | September | |
| 1895 | autumn | 5 |
| 1899 | October | 4 |
| 1903 | early | 3 |
| 1913 | | 10 |
| 1918 | late | 5 |
| 1920 | autumn | 2 |
| | **Australia** | |
| 1890 | January | |
| 1901 | January | 11 |
| 1908 | January | 7 |
| 1913 | January | 5 |
| 1914 | autumn | 2 |
| 1920 | November | 6 |
| 1924 | January | 3 |
| | **India** | |
| 1889 | | |
| 1896 | summer | 7 |
| 1900 | summer | 4 |
| 1907 | autumn | 7 |
| 1914 | August | 7 |
| 1918 | November | 4 |
| 1920 | May | 2 |
| | **Japan** | |
| 1890 | January | |
| 1894 | August | 5 |
| 1897 | autumn | 3 |
| 1905 | September | 8 |
| 1907 | spring | 2 |
| 1914 | spring | 7 |
| 1918 | November | 5 |
| 1920 | March | 1 |
| | **China** | |
| 1888 | | |
| 1897 | | 9 |
| 1900 | May | 3 |
| 1906 | | 6 |
| 1910 | | 4 |
| 1920 | midyear | 10 |

CHART 23. Approximate Duration of Business Cycles, arranged in Chronological Sequence.

White inset figures indicate approximate duration in years.

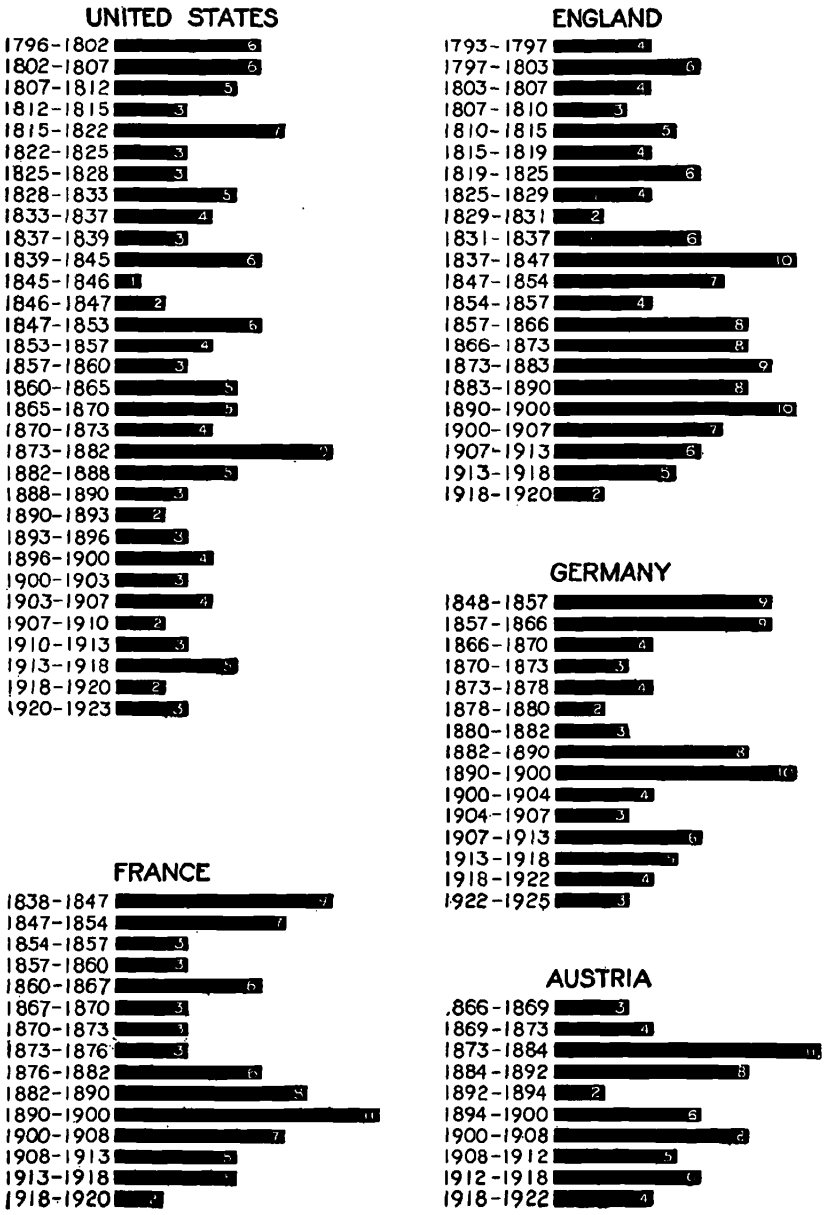
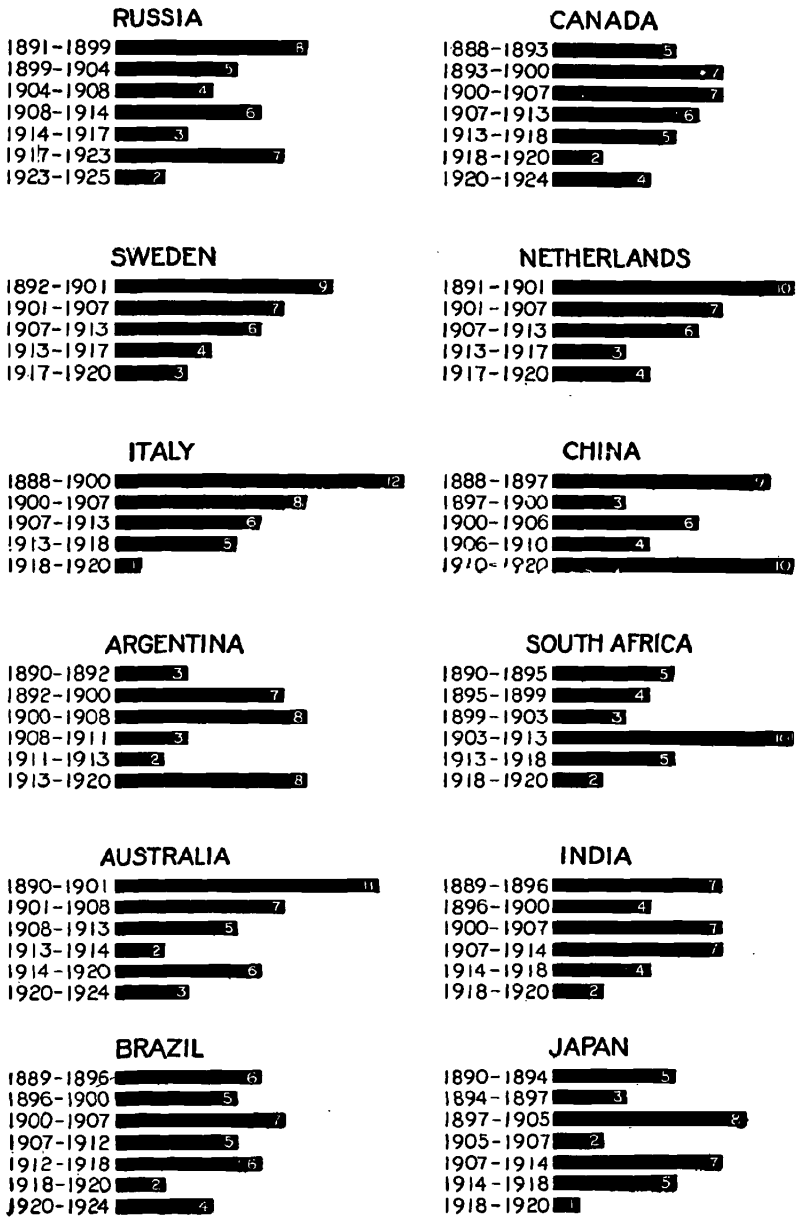


CHART 23. Approximate Duration of Business Cycles, arranged in Chronological Sequence—*Continued.*

White inset figures indicate approximate duration in years.



We can treat the observations upon the duration of business cycles assembled in this table and chart as the data of an historical inquiry, or as the data of a theoretical problem. In the first case we ask: What has been the duration of business cycles in the countries and during the periods for which we have annals? In the second case we ask: What expectations regarding the duration of business cycles are justified by the sample observations in hand?

As historical data, our observations probably contain inaccuracies. Conceiving a business recession as a decline in economic activity which follows a period of expansion and spreads over most of a country's industries, we have sought to find and date every recession which occurred in certain countries during certain periods. On the basis of these recession dates, we have measured the duration of successive cycles to the nearest whole year. Finally, we have struck averages from these measurements. Mistakes may have occurred in any of these steps. We may have omitted some recessions; we may have included some cases which do not fit our definition of recessions; we may have blundered in measuring or averaging. But so long as we are trying merely to report what has taken place in the past, these doubts concerning the accuracy of our work are all that need concern us. The historical record is fixed; it has its unique features and interest; in studying it we can indulge in no speculations.

A subtler problem and doubts of another order are presented when we treat our observations as data for drawing theoretical conclusions regarding the duration of business cycles at large. For this purpose, we must ask, not merely whether our observations are historically dependable, but also whether they constitute a representative sample of the phenomena measured. Are the observations sufficiently numerous? Are they sufficiently independent of each other? Ought we to discard the observations upon cycles which we think have been cut short or prolonged by factors which have no organic relation to business activity?

In the sense in which the term is used here—recurrences of prosperity, recession, depression and revival in the business activities of countries taken as units—the total number of past business cycles may well be less than a thousand. For business cycles are phenomena peculiar to a certain form of economic organization which has been dominant even in Western Europe for less than two centuries, and for briefer periods in other regions. And the average cycle has lasted

five years, if we may trust our data. Of the whole number of cases to date, the 166 cycles we have measured form a significant fraction. By compiling business annals for Norway, Belgium, Switzerland, Denmark, Spain, New Zealand and Chile we could probably get additional observations as satisfactory as some of those already included. Perhaps we could trace business cycles in Greece, Egypt, Turkey, some of the Balkan States, possibly Mexico, and additional countries in Spanish America. Doubtless we might carry our observations further back in most of the seventeen countries which we have studied. But after we had pushed our investigations everywhere into the twilight zone where business cycles are doubtfully recognizable, we should still be dealing with relatively small numbers. A strict standard would bar out not only most of the extensions suggested, but also some of the cases we now include. It is not certain that the Chinese fluctuations should be treated as business cycles proper. At best, they represent conditions only in the coast cities having a large foreign trade. Also, our early American observations are open to question, even on the understanding that they refer only to the most highly organized of the thirteen original states.

The observations are not all independent of each other. We shall see presently that the duration of business cycles in every country influences, and is influenced by, the duration of business cycles in other countries. Moreover, the non-business factors which affect the duration of business cycles often produce uniform results in several countries. To cite one example: 7 of our 17 countries had a two-year cycle at the end of the World War. One hundred and sixty-six observations, many of which come in clusters, are likely to show a less regular distribution around their central tendency than would 166 observations strictly independent of each other.

If we wish to find out what we can about the probable duration of future business cycles, we should discard observations upon cycles whose duration has been determined by factors of a kind not likely to be influential in the future. If the data for any country show unequivocal evidence of a change in the length of cycles, the later data are likely to be a safer guide to expectations than the earlier data, or the full array. But we have no warrant for discarding cases in which cycles seem to have been cut short or prolonged by wars, civil disorders, exceptional harvest conditions, or any other factor, unless we believe that such "disturbing circumstances" will not recur

in the future as in the past. Even the man who has supposed that business cycles "tend" to have some standard period will probably conclude upon studying the present charts that he had better take the data as they come.

In fine, our observations form a fairly satisfactory basis for studying the duration of business cycles. Like all observations, their accuracy is open to question; but they have been made with care and their number is sufficient to allow errors to offset each other in some measure. We should be glad to have a larger sample; but the present one constitutes an appreciable fraction of its "universe." We need not reject any of the observations on the ground that the duration of certain cycles has been affected by "disturbing circumstances"; for we are interested in actual cycles in the actual world where "disturbing circumstances" are always present. We might expect a more regular distribution if all our observations were strictly independent of each other. But once again, as the world is constituted, interdependence in duration is characteristic of business cycles in different countries. A complete array of measurements for all past cycles would resemble our sample in this respect, and future cycles seem likely to show increasing interdependence in duration. Perhaps we should conceive of our distributions as made from a number of independent measurements smaller than the nominal count, but with the use of "weights" which total 166. Many cycles are weighted by one, while other cycles, which began and ended on the same dates in countries with close business relations, or dominated by the same non-business factors, are weighted by numbers running as high as seven.

To put our data in shape for analysis, we must disregard the chronological sequence of cycles of varying length, shown in Chart 23, and rearrange all the cases in frequency tables of the sort already given for American and English cycles—tables which show the number of cycles of each recorded duration. That step is taken in Table 26. But the tabulations by separate countries have slight significance except for England and the United States, because the number of cases is small (5-15 cycles). Hence Table 27 is made from Table 26, by combining the observations from single countries into various groups. To facilitate comparisons among the two dozen distributions here shown, all the samples are put in percentages. Chart 24 is a graphic form of these percentage distributions.

TABLE 26.

FREQUENCY DISTRIBUTION OF BUSINESS CYCLES ACCORDING TO DURATION IN YEARS

Data from Seventeen Countries. Various Dates to 1925.
Based upon Tables 23, 24 and 25.

| Duration in Years | England 1793–1920 | France 1838–1920 | Germany 1848–1925 | Austria 1866–1922 | Italy 1888–1920 | Netherlands 1891–1920 | Sweden 1892–1920 | Russia 1891–1925 |
|---|---|---|---|---|---|---|---|---|
| 1 year | .. | .. | .. | .. | 1 | .. | .. | .. |
| 2 years | 2 | 1 | 1 | 1 | .. | .. | .. | 1 |
| 3 " | 1 | 5 | 4 | 1 | .. | 1 | 1 | 1 |
| 4 " | 5 | .. | 4 | 2 | .. | 1 | 1 | 1 |
| 5 " | 2 | 2 | 1 | 1 | 1 | .. | .. | 1 |
| 6 " | 4 | 2 | 1 | 2 | 1 | 1 | 1 | 1 |
| 7 " | 2 | 2 | .. | .. | . | 1 | 1 | 1 |
| 8 " | 3 | 1 | 1 | 2 | 1 | .. | .. | 1 |
| 9 " | 1 | 1 | 2 | .. | .. | .. | 1 | .. |
| 10 " | 2 | .. | 1 | .. | .. | 1 | .. | .. |
| 11 " | .. | 1 | .. | 1 | .. | .. | .. | .. |
| 12 " | .. | .. | .. | .. | 1 | .. | .. | .. |
| Total number | 22 | 15 | 15 | 10 | 5 | 5 | 5 | 7 |
| Average duration in years | 5.8 | 5.5 | 5.1 | 5.6 | 6.4 | 5.8 | 5.6 | 4.9 |

| Duration in years | United States 1796–1923 | Canada 1888–1924 | Australia 1890–1924 | South Africa 1890–1920 | Argentina 1890–1920 | Brazil 1889–1924 | India 1889–1920 | Japan 1890–1920 | China 1888–1920 |
|---|---|---|---|---|---|---|---|---|---|
| 1 year | 1 | .. | .. | .. | .. | .. | .. | 1 | .. |
| 2 years | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | .. |
| 3 " | 10 | .. | 1 | 1 | 2 | .. | .. | 1 | 1 |
| 4 " | 5 | 1 | .. | 1 | .. | 1 | 2 | .. | 1 |
| 5 " | 6 | 2 | 1 | 2 | .. | 2 | .. | 2 | .. |
| 6 " | 4 | 1 | 1 | .. | .. | 2 | .. | .. | 1 |
| 7 " | 1 | 2 | 1 | .. | 1 | 1 | 3 | 1 | .. |
| 8 " | .. | .. | .. | .. | 2 | .. | .. | 1 | .. |
| 9 " | 1 | .. | .. | .. | .. | .. | .. | .. | 1 |
| 10 " | .. | .. | .. | 1 | .. | .. | .. | .. | 1 |
| 11 " | .. | .. | 1 | .. | .. | .. | .. | .. | .. |
| Total number | 32 | 7 | 6 | 6 | 6 | 7 | 6 | 7 | 5 |
| Average duration in years | 4.0 | 5.1 | 5.7 | 5.0 | 5.0 | 5.0 | 5.2 | 4.3 | 6.4 |

TABLE 27.

FREQUENCY DISTRIBUTION OF BUSINESS CYCLES ACCORDING TO APPROXIMATE DURATION IN YEARS: BY COUNTRIES, GROUPS OF COUNTRIES AND PERIODS

(Based upon Table 26)

| Duration in Years | United States | | England | | United States and England | | United States, England, France, Germany and Austria | | | | | | Duration in Years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Before 1873 | | After 1873 | | Full Period | | |
| | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent | |
| 1 ..... | 1 | 3.1 | .. | ... | 1 | 1.9 | 1 | 2.1 | .. | ... | 1 | 1.1 | 1 |
| 2 ..... | 4 | 12.5 | 2 | 9.1 | 6 | 11.1 | 2 | 4.3 | 7 | 14.9 | 9 | 9.6 | 2 |
| 3 ..... | 10 | 31.2 | 1 | 4.5 | 11 | 20.4 | 12 | 25.5 | 9 | 19.1 | 21 | 22.4 | 3 |
| 4 ..... | 5 | 15.6 | 5 | 22.7 | 10 | 18.5 | 10 | 21.3 | 6 | 12.8 | 16 | 17.0 | 4 |
| 5 ..... | 6 | 18.8 | 2 | 9.1 | 8 | 14.8 | 5 | 10.6 | 7 | 14.9 | 12 | 12.8 | 5 |
| 6 ..... | 4 | 12.5 | 4 | 18.2 | 8 | 14.8 | 8 | 17.0 | 5 | 10.6 | 13 | 13.8 | 6 |
| 7 ..... | 1 | 3.1 | 2 | 9.1 | 3 | 5.6 | 3 | 6.4 | 2 | 4.3 | 5 | 5.3 | 7 |
| 8 ..... | .. | ... | 3 | 13.6 | 3 | 5.6 | 2 | 4.3 | 5 | 10.6 | 7 | 7.4 | 8 |
| 9 ..... | 1 | 3.1 | 1 | 4.5 | 2 | 3.7 | 3 | 6.4 | 2 | 4.3 | 5 | 5.3 | 9 |
| 10 ..... | .. | ... | 2 | 9.1 | 2 | 3.7 | 1 | 2.1 | 2 | 4.3 | 3 | 3.2 | 10 |
| 11 ..... | .. | ... | .. | ... | .. | ... | .. | ... | 2 | 4.3 | 2 | 2.1 | 11 |
| Totals .... | 32 | 100.0 | 22 | 100.0 | 54 | 100.0 | 47 | 100.0 | 47 | 100.0 | 94 | 100.0 | Totals |

| Duration in Years | Countries with close business relations[1] | | Countries relatively independent of each other[2] | | Countries with average duration of 5.5 years or more[3] | | Countries with average duration of 5.2 years or less[4] | | | | Countries with average duration of 5.0 to 5.7[5] years | | Duration in Years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Excluding United States | | Including United States | | | | |
| | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent | |
| 1 ..... | .. | ... | 1 | 2.6 | 1 | 1.4 | 1 | 1.6 | 2 | 2.2 | .. | ... | 1 |
| 2 ..... | 4 | 10.3 | 5 | 13.2 | 5 | 6.9 | 8 | 13.1 | 12 | 12.9 | 11 | 10.5 | 2 |
| 3 ..... | 7 | 18.0 | 5 | 13.2 | 11 | 15.4 | 9 | 14.8 | 19 | 20.4 | 16 | 15.2 | 3 |
| 4 ..... | 6 | 15.4 | 8 | 21.0 | 10 | 13.7 | 10 | 16.4 | 15 | 16.1 | 17 | 16.2 | 4 |
| 5 ..... | 4 | 10.3 | 6 | 15.8 | 7 | 9.6 | 10 | 16.4 | 16 | 17.2 | 13 | 12.4 | 5 |
| 6 ..... | 5 | 12.8 | 6 | 15.8 | 13 | 17.8 | 5 | 8.2 | 9 | 9.7 | 14 | 13.3 | 6 |
| 7 ..... | 2 | 5.1 | 3 | 7.9 | 7 | 9.6 | 9 | 14.8 | 10 | 10.8 | 13 | 12.4 | 7 |
| 8 ..... | 6 | 15.4 | 2 | 5.3 | 7 | 9.6 | 5 | 8.2 | 5 | 5.4 | 9 | 8.6 | 8 |
| 9 ..... | 1 | 2.6 | 1 | 2.6 | 4 | 5.5 | 2 | 3.3 | 3 | 3.2 | 5 | 4.8 | 9 |
| 10 ..... | 2 | 5.1 | 1 | 2.6 | 4 | 5.5 | 2 | 3.3 | 2 | 2.2 | 4 | 3.8 | 10 |
| 11 ..... | 2 | 5.1 | .. | ... | 3 | 4.1 | .. | ... | .. | ... | 3 | 2.9 | 11 |
| 12 ..... | .. | ... | .. | ... | 1 | 1.4 | .. | ... | .. | ... | .. | ... | 12 |
| Totals .... | 39 | 100.0 | 38 | 100.0 | 73 | 100.0 | 61 | 100.0 | 93 | 100.0 | 105 | 100.0 | Totals |

TABLE 27—*Continued*

FREQUENCY DISTRIBUTION OF BUSINESS CYCLES ACCORDING TO APPROXIMATE DURATION IN YEARS: BY COUNTRIES, GROUPS OF COUNTRIES AND PERIODS—(*Continued*)

| Duration in Years | Eight European Countries | | Nine Non-European Countries | | Five English-Speaking Countries[1] | | Twelve Non-English-Speaking Countries | | All Countries except United States | | All Countries | | Duration in Years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent | |
| 1 ..... | 1 | 1.2 | 2 | 2.4 | 1 | 1.4 | 2 | 2.2 | 2 | 1.5 | 3 | 1.8 | 1 |
| 2 ..... | 6 | 7.1 | 11 | 13.4 | 9 | 12.5 | 8 | 8.6 | 13 | 9.7 | 17 | 10.2 | 2 |
| 3 ..... | 14 | 16.7 | 16 | 19.5 | 13 | 17.8 | 17 | 18.3 | 20 | 14.9 | 30 | 18.1 | 3 |
| 4 ..... | 14 | 16.7 | 11 | 13.4 | 12 | 16.4 | 13 | 14.0 | 20 | 14.9 | 25 | 15.1 | 4 |
| 5 ..... | 8 | 9.5 | 15 | 18.3 | 13 | 17.8 | 10 | 10.8 | 17 | 12.7 | 23 | 13.9 | 5 |
| 6 ..... | 13 | 15.5 | 9 | 11.0 | 10 | 13.7 | 12 | 12.9 | 18 | 13.4 | 22 | 13.3 | 6 |
| 7 ..... | 7 | 8.3 | 10 | 12.2 | 6 | 8.2 | 11 | 11.8 | 16 | 11.9 | 17 | 10.2 | 7 |
| 8 ..... | 9 | 10.7 | 3 | 3.7 | 3 | 4.1 | 9 | 9.7 | 12 | 9.0 | 12 | 7.2 | 8 |
| 9 ... | 5 | 6.0 | 2 | 2.4 | 2 | 2.7 | 5 | 5.4 | 6 | 4.5 | 7 | 4.2 | 9 |
| 10 ..... | 4 | 4.8 | 2 | 2.4 | 3 | 4.1 | 3 | 3.2 | 6 | 4.5 | 6 | 3.6 | 10 |
| 11 ..... | 2 | 2.4 | 1 | 1.2 | 1 | 1.4 | 2 | 2.2 | 3 | 2.2 | 3 | 1.8 | 11 |
| 12 ..... | 1 | 1.2 | .. | ... | .. | ... | 1 | 1.1 | 1 | 0.7 | 1 | 0.6 | 12 |
| Totals .... | 84 | 100.0 | 82 | 100.0 | 73 | 100.0 | 93 | 100.0 | 134 | 100.0 | 166 | 100.0 | Totals |

RECENT CYCLES ONLY: ABOUT 1890 TO 1925

| Duration in Years | European and Non-European Countries | | | | Industrial and Non-Industrial Countries | | | | Totals excluding and including United States | | | | Duration in Years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Eight European Countries | | Eight Non-European Countries[2] | | Seven Industrial Countries[3] | | Ten Non-Industrial Countries[4] | | Excluding United States | | Including United States | | |
| | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent | |
| 1 ..... | 1 | 2.2 | 1 | 2.0 | .. | ... | 2 | 3.2 | 2 | 2.1 | 2 | 1.9 | 1 |
| 2 ..... | 3 | 6.7 | 7 | 14.0 | 5 | 11.6 | 8 | 12.9 | 10 | 10.5 | 13 | 12.4 | 2 |
| 3 ..... | 6 | 13.3 | 6 | 12.0 | 9 | 20.9 | 7 | 11.3 | 12 | 12.6 | 16 | 15.2 | 3 |
| 4 ..... | 7 | 15.6 | 6 | 12.0 | 8 | 18.6 | 7 | 11.3 | 13 | 13.7 | 15 | 14.3 | 4 |
| 5 ..... | 6 | 13.3 | 9 | 18.0 | 5 | 11.6 | 11 | 17.7 | 15 | 15.8 | 16 | 15.2 | 5 |
| 6 ..... | 8 | 17.8 | 5 | 10.0 | 6 | 14.0 | 7 | 11.3 | 13 | 13.7 | 13 | 12.4 | 6 |
| 7 ..... | 5 | 11.1 | 9 | 18.0 | 4 | 9.3 | 10 | 16.1 | 14 | 14.7 | 14 | 13.3 | 7 |
| 8 ..... | 3 | 6.7 | 3 | 6.0 | 1 | 2.3 | 5 | 8.1 | 6 | 6.3 | 6 | 5.7 | 8 |
| 9 ..... | 1 | 2.2 | 1 | 2.0 | 1 | 2.3 | 1 | 1.6 | 2 | 2.1 | 2 | 1.9 | 9 |
| 10 ..... | 3 | 6.7 | 2 | 4.0 | 3 | 7.0 | 2 | 3.2 | 5 | 5.3 | 5 | 4.8 | 10 |
| 11 ..... | 1 | 2.2 | 1 | 2.0 | 1 | 2.3 | 1 | 1.6 | 2 | 2.1 | 2 | 1.9 | 11 |
| 12 ..... | 1 | 2.2 | .. | ... | .. | ... | 1 | 1.6 | 1 | 1.1 | 1 | 1.0 | 12 |
| Totals .... | 45 | 100.0 | 50 | 100.0 | 43 | 100.0 | 62 | 100.0 | 95 | 100.0 | 105 | 100.0 | Totals |

[1] England, United States, Canada, Australia, South Africa.
[2] Not including United States.
[3] England, France, Germany, Austria, Netherlands, Sweden, United States.
[4] All other countries included in *Annals*.

The first six figures in the chart deal with the five countries for which we have annals covering relatively long periods. The peculiarities of the American distribution stand out clearly—the pronounced mode, almost a "spike," at three years, and the relatively slight dispersion, indicated by a standard deviation and a coefficient of variation which are respectively the lowest and next the lowest in the list. In the English distribution, there is a curious predominance of cycles lasting 2, 4, 6, 8 and 10 years over cycles lasting 3, 5, 7 and 9 years. In view of the small number of observations (only 22), it is uncertain whether this feature is significant. However that may be, the irregularities in the American and English distributions compensate each other for the most part, so that Figure C is more regular than either of the arrays from which it is made.

Next, the French, German and Austrian observations are combined with the English and American. Advantage is taken of the larger number of cases to compare earlier with later cycles. By using 1873 as the dividing point, we get two groups each of which contains 47 observations. From 1873 to the end of the late war, the business fortunes of these countries, particularly of the European countries, ran more similar courses than in earlier years. That is, the observations in the later period are less independent of each other than the earlier observations—a fact which may explain the lesser regularity of Figure E as compared with Figure D. As a test of this suggestion we have made a distribution of the cycles in the four countries in our list which seem to have the closest business ties with each other for the period in which we have annals for all four. The results, shown in Figure G, constitute one of the least regular distributions in the whole twenty-four. As a companion piece we have made up a random group of similar size from observations which must be nearly independent of each other, taking English cycles in 1793-1825, American cycles in 1825-57, German cycles in 1857-90, Canadian cycles in 1888-1924, and Russian cycles in 1891-1925. In this comparison the 38 independent observations (Figure H) yield a much more regular distribution than the 39 observations which are inter-correlated with each other. Indeed, the contrast in regularity is more striking than we would expect from other comparisons of the sort.

There follow ten figures in which all of the observations are broken into parts on the basis of four criteria. First, the countries are grouped according to the average duration of their business

CHART 24. Percentage Distribution of Business Cycles in Various Countries and Various Periods According to their Approximate Duration in Years.

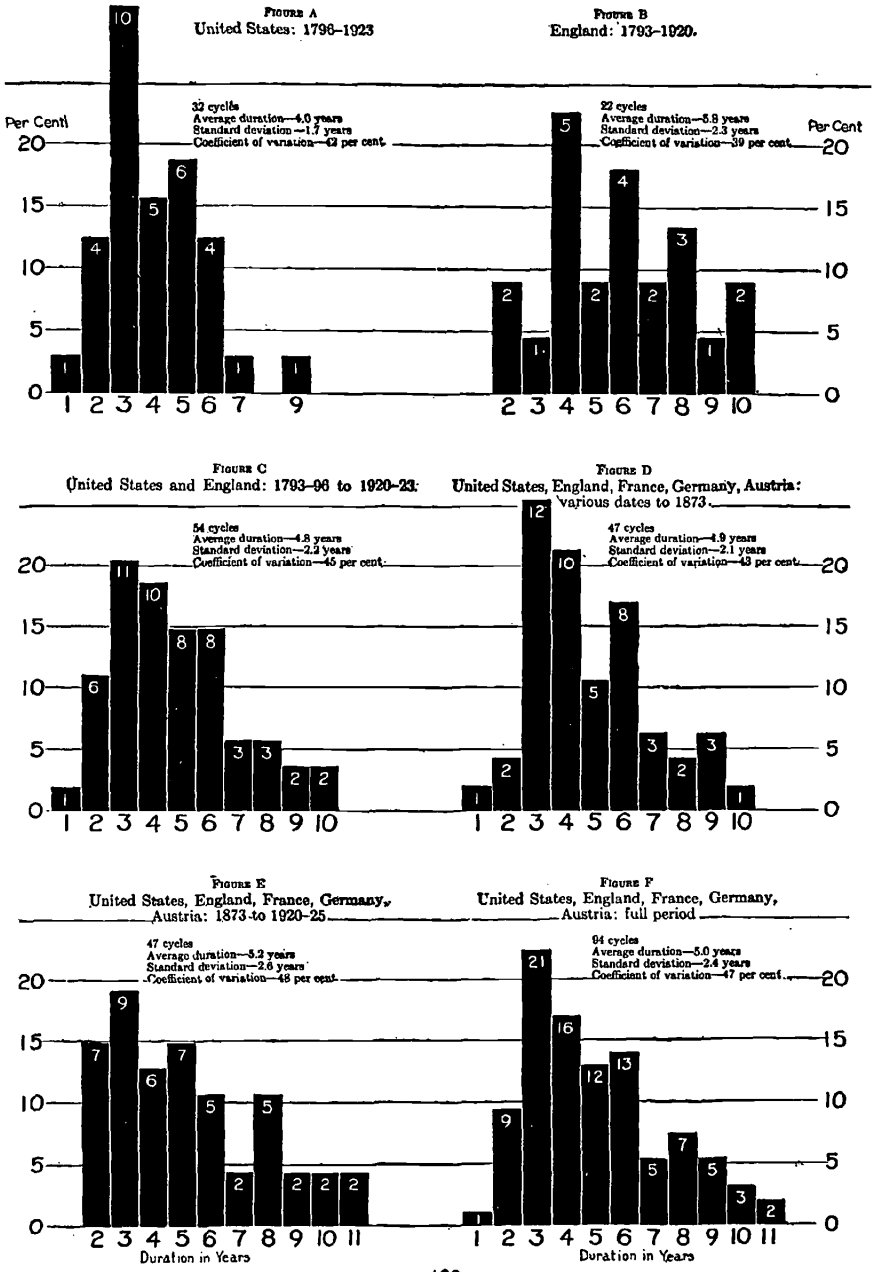


CHART 24. Percentage Distribution of Business Cycles in Various Countries and Various Periods According to their Approximate Duration in Years.—(*Continued*)

FIGURE G

Countries with Close Business Relations—England, France, Germany, Austria: 1866–1920.

FIGURE H

Observations Relatively Independent of Each Other—England, 1793–1825; United States, 1825–1857; Germany, 1857–1890; Russia, 1891–1825; Canada, 1888–1924.

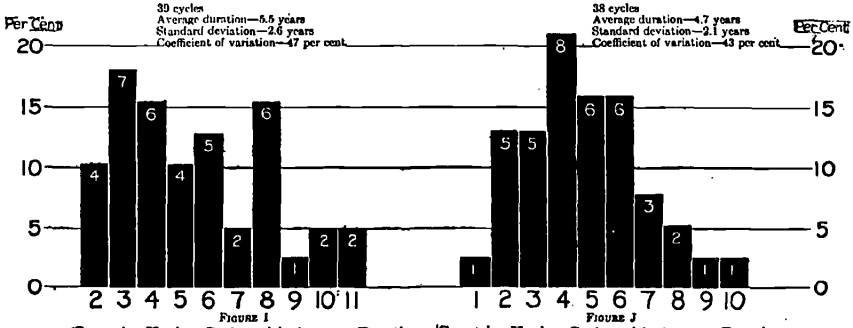



FIGURE I

Countries Having Cycles with Average Duration of 5.5 Years or More—France, Austria, Sweden, England, Australia, Netherlands, Italy, China: various dates to 1920–24.

FIGURE J

Countries Having Cycles with Average Duration of 5.2 Years or Less, excluding United States—Japan, Russia, South Africa, Argentina, Brazil, Canada, Germany, India: various dates to 1920–25.

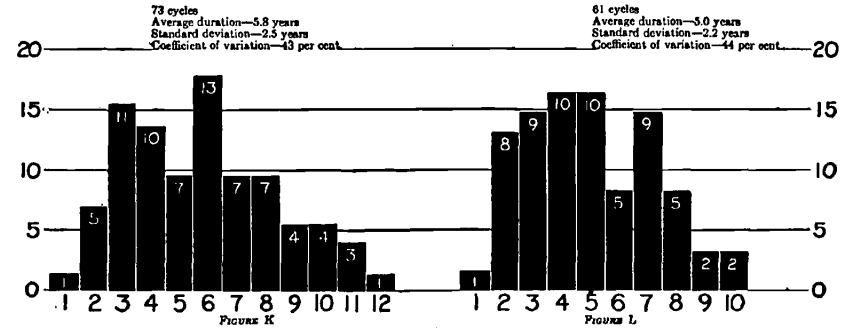



FIGURE K

Countries Having Cycles with Average Duration of 5.2 Years or Less—Countries listed in Figure J, United States added: various dates to 1920–25.

FIGURE L

Countries Having Cycles with Average Duration of 5.0–5.7 Years—South Africa, Argentina, Brazil, Canada, Germany, India, France, Austria, Sweden, England, Australia: various dates to 1920–25.

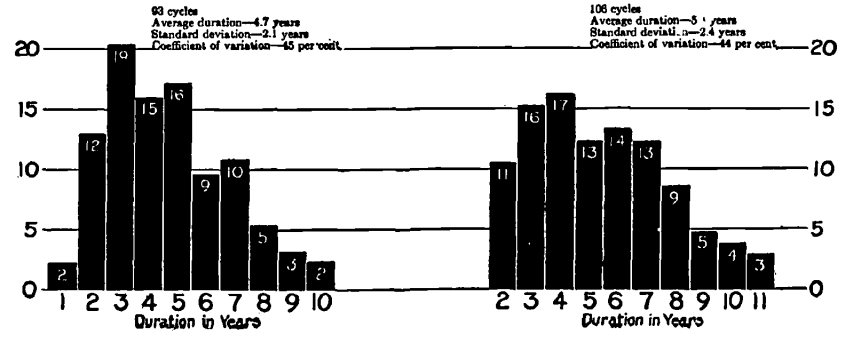


CHART 24. Percentage Distribution of Business Cycles in Various Countries and Various Periods According to their Approximate Duration in Years.—(*Continued*)

FIGURE M

Eight European Countries: various dates to 1920–25.

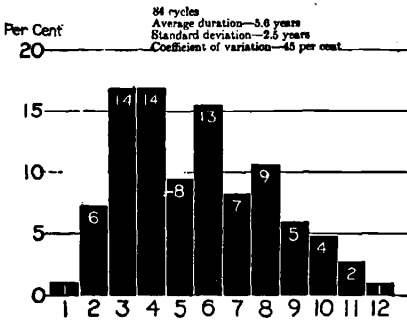



FIGURE N

Nine Non-European Countries: various dates to 1920–24.

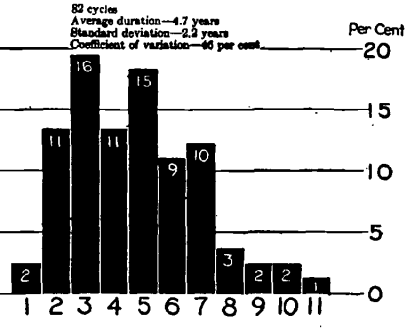



FIGURE O

Five English-Speaking Countries—England, Canada, Australia, South Africa, United States: various dates to 1920–24.

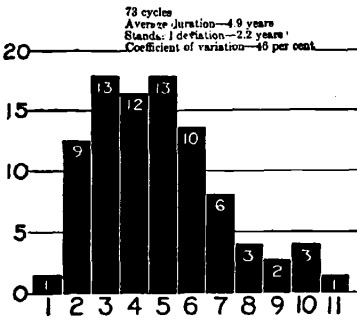



FIGURE P

Twelve Non-English-Speaking Countries: various dates to 1920–25.

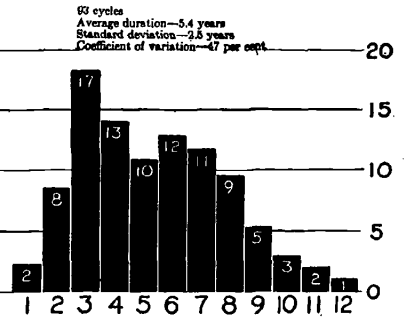



FIGURE Q

All Countries except United States: various dates to 1920–25.

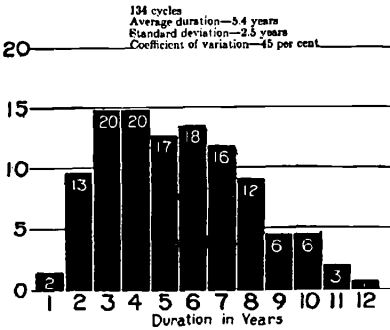



FIGURE R

All Countries: various dates to 1920–25.

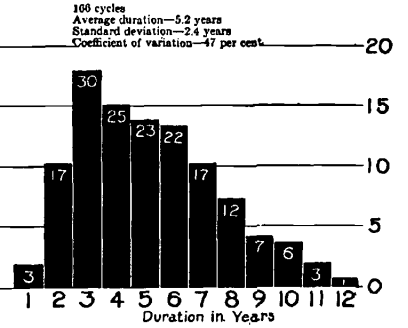
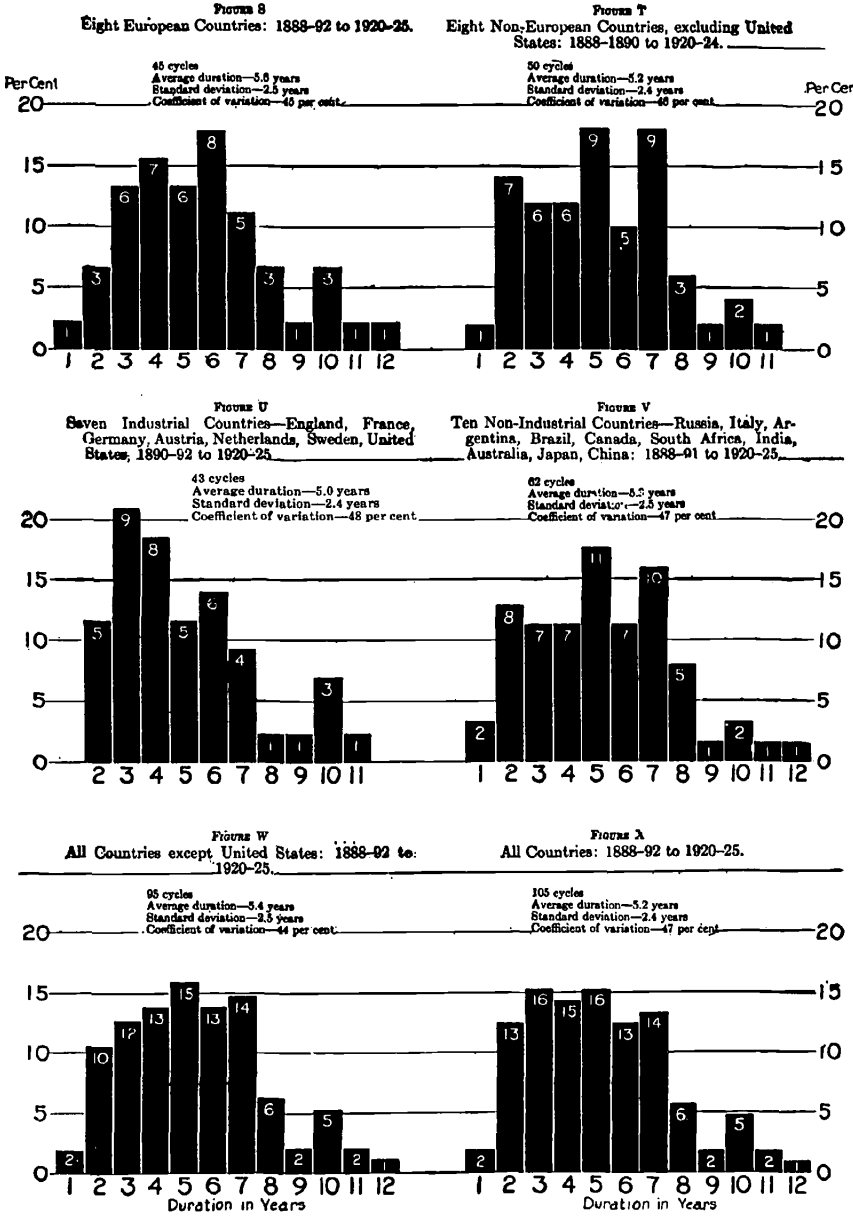


CHART 24. Percentage Distribution of Business Cycles in Various Countries and Various Periods According to their Approximate Duration in Years.—(*Continued*)



cycles as given in our annals. Figure I shows the observations from countries with relatively long cycles, Figures J and K the observations from countries with relatively short cycles (excluding and including the United States), and Figure L the observations from countries with cycles of medium length. The latter group contains part of the observations used in Figure I and part of those used in Figure J. Second, the European and non-European observations are presented separately in Figures M and N. Third, the observations from five English-speaking and twelve non-English-speaking countries are shown. Fourth, Figure Q gives all the non-American observations for comparison with the American distribution of Figure A. Figure R sums up the whole body of data.

The final section of the chart is confined to recent cycles—those occurring since about 1890. Again the data are divided into groups: observations from European and non-European countries, from industrial and non-industrial countries; from all countries except and all including the United States.

When we review the whole array of distributions, we see that the diagrams and the differences among the diagrams are of a sort common in studies of social phenomena. As usually happens in such work, the small samples, especially when they contain inter-correlated observations, are rather irregular. But with increase in the size of the samples and in the independence of the observations, the distributions grow fairly regular, though not symmetrical.

The materials appear to be fairly homogeneous, with the important exception already noted—the distribution of American business cycles in respect to length differs from the distribution of cycles in other countries. This difference stands out most sharply in the contrast between Figures A and Q. It is responsible for the double modes, separated by a lower point, in Figures O and X, and for the relatively high coefficients of variation in most of the groups combining American and foreign observations. In the samples drawn solely from foreign countries, the diagrams usually have a rounded top quite unlike the spike of Figure A. Combining the American with foreign observations generally produces an unambiguous mode at three years, but twice (Figures O and X) it produces the double mode already spoken of.

Barring out the twelve distributions into which American observations enter does not reduce the variety in the position of the crude

modes. Two of the remaining dozen figures have modes at three years (G and P); two at three and four years (M and Q); and eight at 4, 5, or 6 years, if we may include here one double mode at 5 and 7 years (Figure T). By way of generalization we can hardly be more specific than to say that two-thirds of the foreign cycles are concentrated in the interval three to seven years.

All of the distributions have rather high coefficients of variation. In other words, the observations do not cluster closely around their averages. These coefficients are least in the two distributions confined to single countries (Figures A and B), and greatest in the distributions made from American, British, French, German and Austrian observations since 1873 (Figure E). But the difference between the lowest and highest coefficients (39 and 48 per cent) is not great, and 14 of the 24 round off at 45, 46 or 47 per cent.

All the distributions are skewed positively. The range runs farther above the arithmetic mean than below it in every case, and in every case but Figure T the range also runs farther above the crude mode than below it. Moreover, the crude mode is less than the arithmetic mean in 16 cases, about equal to it in 7 cases, and clearly higher than the mean only in Figure T. One of the most significant distributions, Figure W, which includes all cycles since about 1890 in countries other than the United States, approaches symmetry; but the very broadest groups, Figures X (all recent cycles), Q (all foreign cycles), and R (all cycles) are decidedly, though not extremely, skewed.

Before attempting to interpret these frequency distributions, it is advisable to consider the relative duration of periods of prosperity and depression, the bearing of long-period trends of wholesale prices and secular changes in cycle lengths.

### 4. The Relative Duration of Prosperity and Depression.

Dr. Thorp has made a special study of the annals to determine as accurately as possible how many months of the record for each country can be classed as prosperous and how many as depressed. Needless to say, this task involved the continuous exercise of personal judgment.

As pointed out in the comparison between the annals and certain statistical indexes of business activity, contemporary observers are always influenced by recent experience in their use of the terms de-

pression and prosperity. Hence, no rigid criterion of what constitutes business prosperity and depression can be evolved from, or read into, our sources. But that fact does not obstruct, it really facilitates, the task in hand. For we seek to compare the duration of the prosperous phase with that of the depressed phase within each cycle treated as a unit. That the prosperous phases of successive cycles in the same country and of synchronous cycles in different countries attain different degrees of intensity is a matter of deep interest, both practically and theoretically; but it is beside the present point.

Dr. Thorp's chief difficulty was that his sources seldom date the transitions from one phase of a cycle to the next phase. In trying to supply that omission in every case, he had to rely upon indications which are often faint. In detail his decisions must be subject to a wider margin of error than his measurements of the durations of whole cycles, since the recessions on which the latter measurements are based, are the phases which have attracted most attention. Hence it will be advisable to confine ourselves to his averages covering several or many cycles, and to draw only broad conclusions.

Table 28 shows the form and drift of Dr. Thorp's tabulations. It

TABLE 28

RELATIVE DURATION OF DIFFERENT PHASES OF BUSINESS CYCLES IN SEVENTEEN COUNTRIES, 1890–1925

| | Months | Percentages |
|---|---|---|
| Months of prosperity | 2,888 | 39.3 |
| Months of recession and revival | 1,756 | 23.9 |
| Months of depression | 2,700 | 36.8 |
| Total | 7,344 | 100.0 |

Years of prosperity per year of depression: 1.07.

appears that the phases of recession and revival put together make up rather less than one-quarter of the duration of recent cycles. But in view of the difficulty of saying just when revival has blossomed into prosperity, and just when recession has merged into depression, this conclusion should not be stressed heavily. However, if these decisions can be made on a substantially consistent basis, the comparison between the relative duration of the prosperous and depressed phases of the cycles will not be compromised.[1] What the table indicates is that in this period of 36 years the prosperous

[1] Chart 27, below, shows for every cycle the quarters and years which Dr. Thorp has taken as marking off revival and recession.

phases averaged somewhat longer than the depressed phases. A similar conclusion was drawn from American business indexes in Chapter III. Business contraction was found to be "a briefer and more violent process than business expansion." A crude average of over 50 measurements of the duration of the ascending phase of the cycles since 1878 gives 23 months. The corresponding average for the descending phase is about 19 months.[2]

Similar averages showing the relative duration of prosperity and depression for particular countries and periods are given in Table 29. To get comparable results it has been necessary both to take periods which comprise whole cycles, and to make these periods as nearly synchronous as may be. For the results in any one country vary considerably from one period to another. For example, the English and American averages come out in three different periods as follows:

| | Years of Prosperity per Year of Depression | | Years of Prosperity per Year of Depression |
|---|---|---|---|
| England 1790–1925..... | 1.11 | United States 1790–1925.... | 1.50 |
| 1890–1913..... | 1.24 | 1890–1913.... | 1.57 |
| 1890–1920..... | 1.71 | 1890–1923.... | 1.79 |

As a guide to future expectations, the averages which include the years of the great war seem less significant than the averages which we have for longer periods of time in five countries, or than the averages for 17 countries in the period from about 1890 to 1913.

The wide differences between the averages for the countries at the the bottom and the top of the list in Table 29 show how much business conditions are affected by political turmoil and stability. Brazil, China, Russia and South Africa had grave troubles in the period for which we have compiled their annals, and Austria suffered from her proximity to the Balkan volcanoes. The other figures speak for themselves. But we should remember that the figures for each country speak that country's language. Swedish prosperity may differ from Canadian prosperity—the comparison made is between the prosperous and the depressed phases of Swedish cycles in one case, and between the prosperous and the depressed phases of Canadian cycles in the other case. It is risky to say that one of these countries has been more prosperous than the other, even in the period here covered. And it

[2] See Chapter III, section vi, (2) "Month-to-Month Changes," and (5) "Duration of Periods of Expansion and Contraction."

is easy to conceive that any country might change its ranking in such a list radically within a decade or two.

TABLE 29.

RELATIVE DURATION OF THE PROSPEROUS AND DEPRESSED PHASES IN THE BUSINESS CYCLES OF SEVENTEEN COUNTRIES DURING VARIOUS PERIODS

| | Period | Years of Prosperity per Year of Depression |
|---|---|---|
| United States | 1790–1925 | 1.50 |
| England | 1790–1925 | 1.11 |
| France | 1840–1925 | 1.18 |
| Germany | 1853–1925 | 1.18 |
| Austria | 1866–1925 | 0.70 |

| | Period | Years of Prosperity per Year of Depression | Period | Years of Prosperity per Year of Depression |
|---|---|---|---|---|
| Canada | 1888–1924 | 1.86 | 1888–1913 | 2.08 |
| United States | 1890–1923 | 1.79 | 1890–1913 | 1.57 |
| England | 1890–1920 | 1.71 | 1890–1913 | 1.24 |
| France | 1890–1920 | 1.70 | 1890–1913 | 1.47 |
| Australia | 1890–1920 | 1.69 | 1890–1913 | 1.37 |
| Sweden | 1892–1920 | 1.67 | 1892–1913 | 1.89 |
| Netherlands | 1891–1920 | 1.61 | 1891–1913 | 1.59 |
| India | 1889–1920 | 1.43 | 1889–1914 | 1.26 |
| Argentina | 1890–1920 | 1.07 | 1890–1913 | 1.06 |
| Japan | 1890–1920 | 1.05 | 1890–1914 | .75 |
| Germany | 1890–1925 | 1.03 | 1890–1913 | 1.14 |
| Italy | 1888–1920 | .98 | 1888–1913 | .90 |
| South Africa | 1890–1920 | .89 | 1890–1913 | .66 |
| Russia | 1891–1925 | .81 | 1891–1914 | 1.09 |
| China | 1888–1920 | .65 | 1888–1910 | .57 |
| Austria | 1892–1922 | .63 | 1892–1912 | .73 |
| Brazil | 1889–1924 | .45 | 1889–1912 | .29 |
| Seventeen Countries | | 1.14 | | 1.08 |

One of the main reasons why these ratios of years of prosperity to years of depression are unstable is revealed by a further analysis of the long records for England and the United States. From various index numbers of prices, it is known that the long-period trend of the wholesale price level changed direction four times in the 130 years, 1790 to 1920. The turning points came at nearly the same dates in this country and England, save that our greenback prices reached their highest point just before the end of the Civil War in

1865, whereas in gold-standard nations prices continued to rise until 1873. Thus we have in both countries five periods of alternately declining and advancing price trends. From 1790 to 1814 wholesale prices rose unsteadily; from 1814 to 1849 they declined unsteadily; from 1849 to 1865 in the United States and to 1873 in England they rose unsteadily; from 1865 in the United States and 1873 in England they declined unsteadily until 1896; from 1896 to 1920 they rose unsteadily. For the periods thus marked off, Dr. Thorp has obtained the following ratios of years of prosperity to years of depression:

TABLE 30

RELATIVE DURATION OF THE PROSPEROUS AND THE DEPRESSED PHASES OF BUSINESS CYCLES IN PERIODS OF RISING AND DECLINING TRENDS OF WHOLESALE PRICES: ENGLAND AND THE UNITED STATES, 1790–1925

| | Years of Prosperity per Year of Depression | | Years of Prosperity per Year of Depression |
|---|---|---|---|
| England | | United States | |
| 1790–1815 Prices rising ..... | 1.0 | 1790–1815 Prices rising ..... | 2.6 |
| 1815–1849 Prices falling ..... | .9 | 1815–1849 Prices falling ..... | .8 |
| 1849–1873 Prices rising ..... | 3.3 | 1849–1865 Prices rising ..... | 2.9 |
| 1873–1896 Prices falling ..... | .4 | 1865–1896 Prices falling ..... | .9 |
| 1896–1920 Prices rising ..... | 2.7 | 1896–1920 Prices rising ..... | 3.1 |

These results are so uniform and so striking as to leave little doubt that the secular trend of the wholesale price level is a factor of great moment in determining the characteristics of business cycles. That is no novel conclusion; but Dr. Thorp's data lend it new force and precision.

A final point established by study of the relative duration of the prosperous and the depressed phases of business cycles is that the very long cycles usually owe their length primarily to prolongation of depression. Among the 166 cycles we have measured there are 17 which lasted 9 years or more. The average of all our observations, it will be remembered, is 5.2 years. Dr. Thorp has made a special examination of these long cycles to determine when the revivals occurred, and how long were the periods of declining and of increasing activity. His results appear in Table 31.

Whereas the most inclusive average in Table 29 gives a ratio of 1.14 years of prosperity per year of depression, the present table gives a ratio of 0.79. In 11 of the 17 cycles the phase of depression

is longer than the phase of prosperity. The longest period of prosperity found is 72 months; the longest periods of depression run 72, 76 and 100 months. Finally, the average phase of depression in these long cycles is nearly a year longer than the average phase of prosperity.

TABLE 31.

RELATIVE DURATION OF PHASES OF DEPRESSION AND PHASES OF PROSPERITY IN BUSINESS CYCLES LASTING NINE YEARS OR MORE

| Length in Years | Country | Periods Covered by the Cycles | Year of Revival | Months of Depression | Months of Prosperity |
|---|---|---|---|---|---|
| 12 | Italy ..... | 1888, early–1900, early .... | 1897 | 100 | 30 |
| 11 | France ..... | 1890, early–1900, late ..... | 1895 | 60 | 42 |
| 11 | Austria ..... | 1873–1884 ..... | 1880 | 72 | 36 |
| 11 | Australia ... | 1890–1901 ..... | 1896 | 62 | 48 |
| 10 | England .... | 1837, early–1847, April .... | 1843 | 68 | 44 |
| 10 | England .... | 1890, Nov.–1900 ..... | 1895 | 42 | 48 |
| 10 | Germany ... | 1890, early–1900, summer.. | 1894, late | 44 | 51 |
| 10 | Netherlands . | 1891–1901 ..... | 1896 | 48 | 48 |
| 10 | South Africa. | 1903–1913 ..... | 1909 | 60 | 36 |
| 10 | China ..... | 1910–1920 ..... | 1916 | 60 | 48 |
| 9 | United States | 1873–1882 ..... | 1878 | 57 | 42 |
| 9 | England .... | 1873, late–1883, early ..... | 1880 | 69 | 24 |
| 9 | France ..... | 1838–1847 ..... | 1840 | 24 | 72 |
| 9 | Germany ... | 1848–1857 ..... | 1853 | 54 | 42 |
| 9 | Germany ... | 1857–1866 ..... | 1860 | 18 | 66 |
| 9 | Sweden ..... | 1892–1901 ..... | 1895 | 30 | 60 |
| 9 | China ..... | 1888–1897 ..... | 1895 | 76 | 12 |
| | | | Total | 944 | 749 |
| | | | Average | 55 | 44 |

Years of prosperity per year of depression: 0.79.

## 5. SECULAR CHANGES IN THE AVERAGE DURATION OF BUSINESS CYCLES.

Another matter which demands attention is the differences between the average duration of business cycles in various countries revealed by Table 26. In particular, why do American cycles average only 4 years in length, while English cycles during the same period average nearly 5 years and 10 months?

A possible clew to this puzzle is suggested by the hypothesis, developed in Chapter II, that business cycles are associated with a particular form of economic organization, here called "business economy."

If that hypothesis be valid, the characteristics of business cycles may be expected to change as economic organization develops. We have historical evidence to support this supposition in respect to at least one characteristic: violent panics are giving way to recessions. May not the average intervals between recessions also vary from generation to generation?

In the introduction to *Business Annals* I noted that secular changes in duration have occurred in certain countries for which Dr. Thorp has compiled annals covering an extended period. But I failed to develop the full significance of the data. Dr. Frederick C. Mills of the National Bureau's staff has made a more extended study of the problem, and suggested a tentative explanation, not only of the secular changes which he finds in the average duration of business cycles in the United States, England, France, and Germany, but also of the differences in the average length of business cycles in our 17 countries.[1]

> Dr. Mills formulates his hypothesis as follows:
> . . . the duration of business cycles in a given country is a function of the stage of industrial development which that country has attained. More specifically: When the modern type of economic organization is in the initial stage of development, the average duration of business cycles is relatively long. During the stage of rapid growth, when modern types of business enterprise and modern forms of industrial organization are being applied extensively, business cycles are of relatively short average duration. With the decline in the rate of economic change and the attainment of comparative stability, business cycles increase again in length.

To test this hypothesis adequately Dr. Mills recognizes that he needs, not only a larger body of observations, but also an "objective criterion for distinguishing the stages in a country's industrial development, or for classifying countries according to their present state of development." On the view developed in this book, the factor in economic organization critically important for the understanding of business cycles is not the "stage of industrial development" as such, but the proportion of the people who are depending mainly upon making and spending money incomes, and the proportion of total business that is done by large-scale enterprises. Needless to say, we

[1] "An Hypothesis concerning the Duration of Business Cycles," *Journal of the American Statistical Association*, December, 1926, vol. xxi, pp. 447-457.

have neither an "index of industrialization," nor an index of business economy. Under these circumstances, Dr. Mills is forced to make a somewhat arbitrary division of Dr. Thorp's materials into the periods suggested by his hypothesis—a division based partly on the evidence of the annals themselves and partly on other information. Thus he takes the early stage of industrialization in the United States to last from the beginning of the annals to 1822, since which time the country has been in the stage of rapid economic transition. In England he supposes that the first stage had been passed before our annals begin, that the second stage extended from 1793 to 1831, and the third from 1831 to date. The countries which he assigns to this third stage of decreasing rate of progress are England since 1831, France since 1876, Austria since 1873, the Netherlands and Sweden since the beginning of their annals in 1890. Germany he puts into the first stage until 1866, and into the second stage since then.[2]

[2] Mills' full classification of the materials is as follows:

A. Countries in the early stages of industrialization:

| | | |
|---|---|---|
| United States | to 1822 | (Annals begin 1796)* |
| Germany | to 1866 | " " 1848 |
| Italy | to 1907 | " " 1888 |
| Canada | to 1913 | " " 1888 |
| Australia | to 1913 | " " 1890 |
| South Africa | to 1913 | " " 1890 |
| China | to date | " " 1888 |
| India | to date | " " 1889 |
| Russia | to date | " " 1891 |
| Argentina | to date | " " 1890 |
| Brazil | to date | " " 1889 |

B. Countries in the stage of rapid economic transition:

| | | |
|---|---|---|
| England | to 1831 | (Annals begin 1793) |
| United States | 1822 to date | |
| France | to 1876 | " " 1838 |
| Germany | 1866 to date | |
| Austria | to 1873 | " " 1866 |
| Italy | 1907 to date | |
| Canada | 1913 to date | |
| Australia | 1913 to date | |
| South Africa | 1913 to date | |
| Japan | to date | " " 1890 |

C. Countries in which the transition is going forward at a decreasing rate:

| | | |
|---|---|---|
| England | 1831 to date | |
| France | 1876 to date | |
| Austria | 1873 to date | |
| Netherlands | to date | (Annals begin 1891) |
| Sweden | to date | " " 1892 |

* The dates given as marking the beginning of the *Annals* are the dates of the first recorded recessions. In cases where the beginning of a stage is not defined in the above table, that stage is assumed to date from a period prior to the beginning of the *Annals*.

On this basis, Dr. Mills gets the following results:

| | Early stages of industrialization | Stage of rapid economic transition | Stage of relative economic stability |
|---|---|---|---|
| Number of observations | 51 cycles | 77 cycles | 38 cycles |
| Mean duration | 5.86 years | 4.09 years | 6.39 years |
| Standard deviation | 2.41 " | 1.88 " | 2.42 " |

He computes that differences as great as those between the averages of the first and second periods and between the averages of the second and third periods would arise as the result of sampling fluctuations about one time out of 50,000 and 1,000,000 trials respectively. The explanation for the relatively short duration of American cycles suggested by these results is "an exceptional prolongation of the period of industrial transition in this country."

There can be little doubt that the average duration of business cycles has undergone secular changes in the countries for which Thorp has compiled the longest records. If our annals are valid, this conclusion is definitely established for England, and made highly probable for France and the United States. Mills gives the following averages for periods which differ in the case of one country from those used in his systematic classification of all the materials:

| | | | | | |
|---|---|---|---|---|---|
| England | 1793–1831 | 9 cycles | Average duration | 4.22 years |
| " | 1831–1920 | 13 " | " " | 6.85 " |
| France | 1854–1876 | 6 " | " " | 3.67 " |
| " | 1876–1920 | 7 " | " " | 6.32 " |
| United States | 1796–1822 | 5 " | " " | 5.20 " |
| " " | 1822–1860 | 11 " | " " | 3.50 " |
| " " | 1860–1888 | 5 " | " " | 5.50 " |
| " " | 1888–1923 | 11 " | " " | 3.20 " |

Thus English and French cycles have grown longer, while American cycles have gone through a curious double swing, first decreasing in length, then increasing, then decreasing again.

But, granting the statistical significance of these averages, and their value as a summary of past experience, what theoretical importance can we attach to them? From the empirical viewpoint they show the existence of secular trends in the duration of business cycles. We have seen that purely empirical trends can be used only in the most tentative fashion as a basis for forming future expectations, or as

a basis for giving explanations. But if trends can be developed from rational hypotheses, they become far more useful. Thus we come back to a critical consideration of the evidence for Mills' hypothesis concerning the connection between the average duration of business cycles and the state of industrialization.

It is doubtful if any half-dozen economic historians, given Mills' necessarily vague definitions of three stages of industrialization, and asked to date the close of each stage in the 17 countries for which we have business annals, would undertake the task, or find themselves in substantial agreement if they did. It is easy to question many of the dates assigned by Mills, and hard either to establish or to disprove their validity. To canvass the pertinent evidence in detail would be an enormous task, and would lead to no conclusive result unless prefaced, first by a more precise statement of the hypothesis than Mills has given, and second by the development of objective standards by which to rate the significance of what facts might be established.

Our best hope for further light upon the hypothesis which Mills makes so interesting lies in further analytic work upon secular trends in economic history. Few problems are more fascinating, more important, or more neglected than the rates at which economic development proceeds in successive generations and in different countries. It is conceivable that men who combine the requisite statistical technique with the requisite historical knowledge can develop effective methods of utilizing the scattered figures which survive in little known sources, and the abundant descriptive materials, in such fashion as to show at least the broad stages in the recent economic development of the leading commercial nations. If they do, sidelights upon changes in various characteristics of business cycles will be a not unimportant gain from their labors.

## 6. Conclusions.

1. Our measurements of the intervals between recessions do not bear precisely upon the obsolescent debate concerning the periodicity of crises. But measurements made from the annals upon the old plan would be as fatal to the hypothesis of periodicity as the measurements which I prefer. Indeed, counting from crisis to crisis would make the limits within which cycles vary even wider than does counting from recession to recession. The longest cycle shown by the annals

—the Italian case of 1888-1900—would be extended from 12 to 19 years if we skipped the mild recession of 1900 and passed on to the crisis of 1907. Perhaps still longer cycles might be found, were this method of counting systematically applied to all countries. Nor could the extension of the range in one direction be compensated by reduction at the other end of the scale. The shortest cycle could not be prolonged beyond two or three years, except by such violent procedures as telescoping the American panics of 1837 and 1839 into a single crisis.

Nor can I confirm the ingenious suggestion made by Professor H. S. Jevons and Mr. Joseph Kitchin, that long cycles are multiples of two or three short ones.[1] Were such the case, and were the short cycles 3⅓ or 3½ years long as these writers suppose, one would expect our frequency diagrams to show modes, primary or secondary, at 3, 7, and 10, or 11 years. None of them do so. There are diagrams with modes, pronounced or faint, at 3 and 7 years, and 4 and 8 years. But there are also diagrams with modes, pronounced or faint, at 3 and 4 years; 3 and 5 years; 3 and 6 years; 3 and 8 years; 3, 4, 6, and 8 years; 3, 5, and 7 years; 3, 5, and 10 years; 3, 6, and 10 years; 4 and 5 years; 4 and 6 years; 5 and 7 years, etc. More significant is the fact that as the size of the samples increases the minor modes tend to disappear, instead of tending to grow clearer. In the most inclusive sample of all (Figure R of Chart 24), there are no secondary modes.

While few if any recent writers maintain the hypothesis of periodicity in any form, many of them do give some average figure to represent the duration typical of business cycles. Such averages are adequate for certain purposes. But the present results show that no average can suggest the facts about the duration of cycles which are most significant for theory and practice.

2. If there is any regularity in the sequence of cycles of different lengths, I have failed to find it. Chart 23, which represents the duration of cycles taken in chronological order, shows the hazard of attempting to forecast how long the next cycle will last in any of our countries. Neither modal length, nor the duration of the preceding cycle is a safe guide.

3. A semblance of regularity does appear, however, when we disregard chronological sequence and group our observations in fre-

[1] See Herbert Stanley Jevons, *The Sun's Heat and Solar Activity*, London, 1910, and Joseph Kitchin, "Cycles and Trends in Economic Factors," *Review of Economic Statistics*, January, 1923, Preliminary vol. v, pp. 10-16.

quency tables. And the regularity becomes more marked as the size of the sample increases, that is, as the number of independent observations upon the duration of business cycles becomes greater.

The regularity which emerges, consists, not in the preponderance of cycles of any given duration, but in the way in which cycles of different durations group themselves about their central tendency. The distribution is of a type found in many studies of biological and social phenomena. It is not symmetrical, but skewed positively. In all the groups into which we have divided the observations for analysis, the range runs farther above than below the arithmetic mean, and in two-thirds of the groups the crude mode is less than the arithmetic mean.

4. American cycles have a shorter average duration than those of any other country studied. The averages of 32 American and of 134 foreign measurements are 4.0 and 5.4 years respectively. The shortest average duration found in any foreign country is 4.3 years in Japan, where 7 cycles occurred in approximately the period covered by 10 American cycles. The American distribution shows a pronounced mode at 3 years; the most inclusive of the foreign distributions shows a rounded top with equal numbers of cases at 3 and 4 years, and no marked decline in numbers before 8 years.

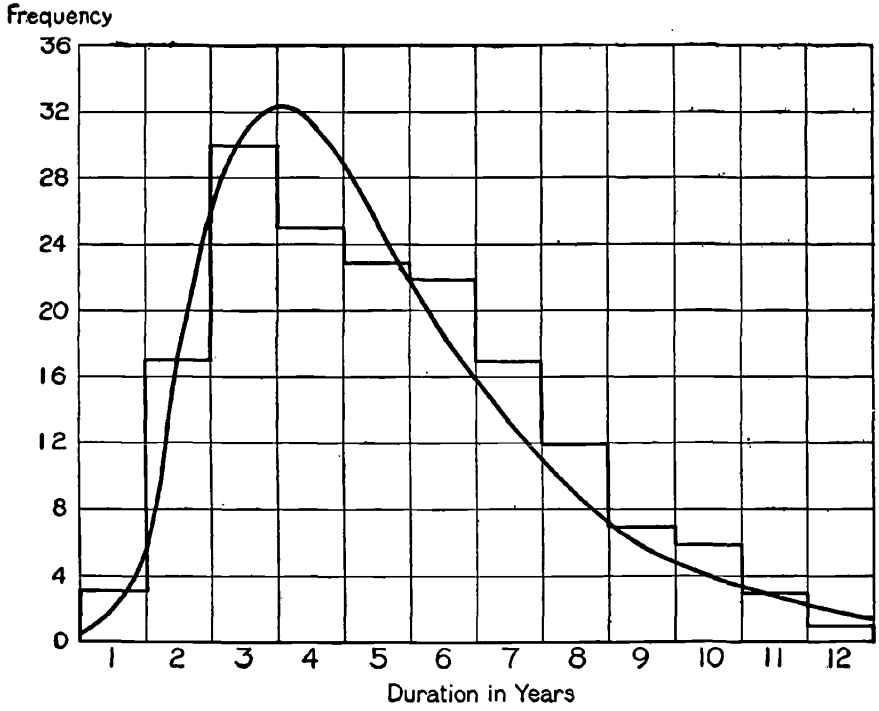
5. Secular changes in the average duration of business cycles can be traced in countries for which business annals have been compiled for long periods. In England and France the duration has increased; in the United States the duration averaged 5.2 years in 1796-1822, 3.5 years in 1822-60, 5.5 years in 1860-88, and 3.2 years in 1888-1923. This fact makes it difficult to adapt the physical-cause theories of economic fluctuations to business cycles.

The most interesting hypothesis concerning these changes in secular length, and concerning the differences in the average duration of cycles in different countries at a given period, is that offered by Dr. Frederick C. Mills, who suggests tentatively that business cycles tend to be relatively long in a country during the early stages of industrialization, relatively short during the stage of rapid economic transition, and relatively long again when the rate of transition decreases.

6. While our frequency distributions lack the symmetry of the Gaussian normal curve, their form suggests fitting "a logarithmic normal curve; that is a Gaussian curve in which the successive units [standard deviations] of the horizontal scale are readjusted to dis-

tances having a constant ratio rather than a constant difference." [2] This experiment has been tried upon Figure R of Chart 24—the distribution which includes all of our 166 observations. Chart 25 shows that the fit of the logarithmic normal curve to the data is on the whole rather close.[3]

CHART 25. Logarithmic Normal Curve Fitted by Davies' Method to the Frequency Distribution of 166 Observations upon the Duration of Business Cycles.




From this fact we infer that, like other biological and social phenomena whose distributions are well described by some form of the normal curve, the durations of business cycles may be regarded as the net resultants of a multitude of factors which are largely inde-

[2] See George R. Davies, "The Logarithmic Curve of Distribution," *Journal of the American Statistical Association*, December, 1925, vol. xx, pp. 467-480. Dr. Thorp has adopted Professor Davies' method in making the chart on this page.

[3] When the cycles now running in our 17 countries are ended, the new batch of observations promises to modify the distribution of Chart 25 somewhat. Five years have already elapsed since the latest recession in three of our countries, and six years in seven countries.

pendent of each other. If there is any dominant factor or set of factors, which tends to produce cycles of uniform duration, its influence is greatly modified by a host of other factors combined in ways which vary endlessly. This conclusion has an important bearing upon the theory of business cycles and the methods by which that theory may be improved.[4]

7. Regarding the relative duration of the several phases which make up business cycles, the annals yield certain fragmentary, but significant, results.

As we interpret them on the basis of current business reports, the phases of recession and revival are relatively brief.[5] Put together, they account for only one-quarter of the duration of business cycles on the average. Of the remaining three-quarters, the prosperous phase occupies a somewhat longer time than the phase of depression. But the ratio of months of prosperity to months of depression varies widely from country to country, and within any country it varies widely from cycle to cycle. Consequently, the average ratios ap-

[4] Dr. Oskar Morgenstern has kindly allowed me to read the manuscript of a paper on "Internationale vergleichende Konjunkturforschung" (soon to appear in the *Zeitschrift für die gesammte Staatswissenschaft*), in which he questions the propriety of my averaging together measurements of the duration of business cycles which have occurred in communities of widely different economic organization. As Dr. Morgenstern points out, the hypothesis that there is an intimate connection between the form of economic organization and business cycles implies that radical differences in economic organization are associated with corresponding differences in cyclical fluctuations. Since I work with the hypothesis in question, am I justified in assembling in a single array measurements of cycles in communities so unlike in organization as contemporary England and China, or the United States of the 20th and of the 18th centuries?

As said in the text, I take the Chinese reports to represent conditions in the coast cities only. Similarly, in dealing with the earlier American annals, I use only the reports from the northern and eastern states, paying no attention to the reports from the southern states and western settlements, which are frequently quite different in tenor. There is evidence that business economy, as defined in Chapter II, had become established (though not highly developed) by 1790 from Pennsylvania to Massachusetts, and by 1890 in the coast cities of China. If that opinion is valid, I seem justified in treating the fluctuations of economic fortune experienced by these two communities as business cycles.

Granted so much, is not something to be learned by studying the available measurements of these highly variable phenomena as a whole, as well as in a variety of small groups? Of course, it would be easy to over-stress the significance of my grand average of the duration of business cycles. I do not attach much importance to the arithmetic mean of the total array; but I do think the distribution of the observations around their central tendency is a matter of much theoretical interest.

Finally, I agree with Dr. Morgenstern that the relation between the duration of business cycles and changes in the form of economic organization was not adequately treated in my introduction to Thorp's *Business Annals*. Since that book was published, Mills' hypothesis has put the problem in a clearer form, and indicated how much work may be required to reach a satisfactory solution.

[5] When it is necessary to define revivals and recessions as the periods within which all of the statistical series in a large collection turn up or turn down, these two phases become relatively long. But more of that matter in the volume to follow.

proach stability only when long periods of time and many countries are included. Perhaps the most significant figures are those for the United States and England in 1790-1925, and for all our 17 countries in 1890-1913. These three results come out respectively 1.50, 1.11 and 1.08 years of prosperity per year of depression.

Both the English and the American records indicate that the relative duration of the prosperous and depressed phases of business cycles is dominated by the secular trend of wholesale prices. In the three periods of rising price trends since 1790, the prosperous phases of the cycles have been prolonged and the depressed phases have been relatively brief. In the three periods of declining price trends, the prosperous phases of the cycles have been relatively brief and the depressed phases prolonged. While the observations upon which these conclusions rest are subject to a margin of uncertainty in every cycle considered, random errors could hardly produce such uniform results as we find.

Finally, it appears that the depressed phases of business cycles are susceptible of greater prolongation than the prosperous phases. Whereas our averages including many cycles all show a slight preponderance of years of prosperity over years of depression, our long cycles as a group show a marked preponderance of years of depression over years of prosperity.

In weighing the conclusions drawn in this section, one should bear in mind certain features of the data and methods used.

No selection or "adjustment" has been practiced upon the observations. The "abnormal cases"—if that phrase has an intelligible meaning—are included with the "normal." Every reader of the annals will note how frequently foreign wars and domestic turmoil, harvest fluctuations, epidemics, floods and earthquakes have checked or reënforced the tides of business activity. A tendency toward alternations of prosperity and depression must have considerable constancy and energy to stamp its pattern upon economic history in a world where other factors of most unequal power are constantly present, and where one or other of these factors, singly or in combination, rises to dominance at irregular intervals.

Our measurements are based solely upon the intervals between recessions. It would be desirable to check the results by a second set, based on the intervals between revivals. We have not attempted

such a check, because business commentators have paid less attention to the upward than to the downward turning points of business cycles. The materials for making the second set of measurements are less full and reliable than the materials we have exploited. If a second set as satisfactory as the first could be made, the frequency distributions it yielded would doubtless differ in numberless details from the frequency distributions here presented. But we have no reason to believe that the broad conclusions suggested by the new frequency distributions would run counter to the conclusions we have drawn.

The year is too large a unit for measuring business cycles. Our results have the crudity of an effort to ascertain the stature distribution of men, women and children from measurements made in feet. In statistical work with time series, it is often possible to substitute the more appropriate unit of a month. But such investigations of business fluctuations are confined to those narrow limits of time, place, and type of business for which elaborate numerical data have been collected.

The best we could do when we were seeking to determine the duration of business cycles by using monthly statistics was to make numerous measurements of a dozen cases in one country. Five business indexes, covering by months part or all of the last half century in the United States, together with the plan of counting durations both from crest to crest and from trough to trough, enabled us to accumulate 101 observations upon the lengths of what the annals represent as 12 cycles (or 12½ if we start with the trough of 1878). That the results obtained in this way agree with the results obtained from the same period of the annals appears from Chart 21. For that chart shows that the most significant of the statistical indexes which run back to 1875 give the same recession dates as do the annals.

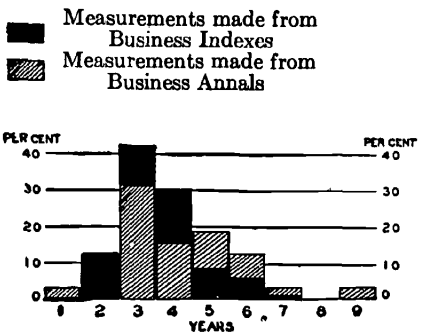
It may be worth while, however, to compare the 101 statistical measurements of the 12½ cycles of 1878 to 1923 with the 32 measurements of 32 cycles made from the annals of 1796 to 1923. To that end, we may condense the quarterly figures made from the statistical observations which ran originally by months, into yearly figures, assigning each quarter to that year into which it presumably would fall were the reckoning made from annals. For example, we count the cycles lasting approximately two years as those included in the four quarters centering on 19, 22, 25 and 28 months—that is, the quarters which run from 1½ years to 2 years and five months. Chart 26 gives the results.

## CHART 26

PERCENTAGE DISTRIBUTION OF MEASUREMENTS OF THE DURATION OF BUSINESS CYCLES IN THE UNITED STATES BASED UPON BUSINESS INDEXES, 1875–1925, AND BUSINESS ANNALS, 1790–1925.

By using 5 business indexes, and counting intervals both from trough to trough and crest to crest of the cycles, 101 measurements were made of the duration of 12½ cycles. The measurements, originally expressed in months, were grouped first by quarters, and later by years. See Table 16, Chart 20, and context in Chapter III.

The Annals yield a single set of measurements of the duration of 32 cycles. See Table 27.




| | Percentage Distribution of the Measurements made from | |
|---|---|---|
| | Business Indexes 1875–1925 | Business Annals 1790–1925 |
| 1 year..... | .3 | 3.1 |
| 2 years..... | 12.1 | 12.5 |
| 3 " ..... | 42.0 | 31.2 |
| 4 " ..... | 30.1 | 15.6 |
| 5 " ..... | 8.4 | 18.8 |
| 6 " ..... | 6.0 | 12.5 |
| 7 " ..... | 1.0 | 3.1 |
| 8 " ..... | .... | .... |
| 9 " ..... | .... | 3.1 |
| | 100.0 | 100.0 |

The similarity of the two figures on this chart is patent. If the measurements based on statistics show an even greater concentration at three years than do the measurements made from the annals (42 per cent of the observations as compared with 31 per cent), it is because of the difference in the years covered by the two sets of data. If we take only that part of the annals covered by the business indexes, we find 5 of the 12 cycles lasting 3 years, and 5 is 42 per cent of 12. Similar explanations apply to the other differences between the two figures:—for example, the lack of very short and very long cycles in 1875-1925 as compared with 1790-1925, accounts for the margins between the lines at 1 and 9 years.

In view of the agreement between the two sets of measurements, it seems safe to say (1) that if our business indexes extended back to 1790, they would show less concentration of cycles at 3 years, and a wider spread in the measurements; (2) that if we could elaborate the measurements made from the annals, by counting in months, and reckoning duration not merely from recession to recession, but also

from revival to revival, we should find the modal length to be more than 36 months, as Chart 20 indicates, though less than three and a half years.

## V. International Relationships Among Business Cycles.

### 1. A Conspectus of Business Conditions in Different Countries.

Opinions differ widely concerning the relations between the economic fortunes of different countries. One prevalent view, often implied in discussions of public policy though seldom avowed openly, is that competition for foreign markets and foreign investments makes one nation's gain another nation's loss. A second view is that small countries with a vast commerce—England, the Netherlands, Belgium, Sweden and Norway—experience prosperity or depression as world business quickens or slackens; but that nations with a continental spread need feel slight concern about foreign factors—to them internal development is of overshadowing importance. There is still a third view, that business enterprise has been silently establishing a "world economy," a "commercial league of nations," in which all the members prosper or suffer together.

Needless to say, the annals do not give clear proof or disproof of any of these contentions. But they do indicate a trend in the direction of "world economy."

To facilitate international comparisons of economic fortunes, the annals of all the countries studied have been compressed into a single table. This conspectus begins with the United States and England in 1790, adds France in 1840, Germany in 1853, Austria in 1867, and 12 other countries in 1890. For the last generation it affords a fair view of world experience. The entries have the bleakness of statistical averages; they do not indicate the complexity of conditions prevailing every year within each country. For most purposes the fuller form of the annals given in Dr. Thorp's book should be used rather than the conspectus. But it is only as we concentrate in each country upon the net resultant of its diverse conditions that we can gain a clear view of the international similarities and diversities. Even the conspectus is not simple enough to tell its own story; it needs to be analyzed and summarized, as the reader who looks it over will agree.

TABLE 32

CONSPECTUS OF BUSINESS FLUCTUATIONS IN VARIOUS COUNTRIES

| | 1790 | 1791 | 1792 | 1793 |
|---|---|---|---|---|
| United States | Revival; prosperity | Prosperity | Prosperity; financial distress | Prosperity |
| England..... | Moderate prosperity | Prosperity | Prosperity; financial strain | Recession; panic; depression |

| | 1794 | 1795 | 1796 | 1797 |
|---|---|---|---|---|
| United States | Uneven prosperity | Prosperity | Recession; depression | Depression; panic |
| England..... | Depression | Revival | Uneven prosperity | Recession; panic; depression |

| | 1798 | 1799 | 1800 | 1801 |
|---|---|---|---|---|
| United States | Depression | Revival | Prosperity | Mild prosperity |
| England..... | Depression | Depression | Depression | Depression; revival |

| | 1802 | 1803 | 1804 | 1805 |
|---|---|---|---|---|
| United States | Recession | Mild depression | Revival | Prosperity |
| England..... | Prosperity | Prosperity; recession | Mild depression | Revival |

| | 1806 | 1807 | 1808 | 1809 |
|---|---|---|---|---|
| United States | Prosperity | Prosperity; recession | Depression | Depression |
| England..... | Prosperity | Recession | Mild depression | Revival; prosperity |

| | 1810 | 1811 | 1812 | 1813 |
|---|---|---|---|---|
| United States | Revival | Moderate prosperity | Brief recession; uneven prosperity | Prosperity |
| England..... | Prosperity; recession | Deep depression | Revival | Prosperity |

| | 1814 | 1815 | 1816 | 1817 |
|---|---|---|---|---|
| United States | Prosperity; financial distress | Prosperity; panic; recession | Depression | Mild depression |
| England..... | Uneven prosperity | Boom; recession | Deep depression | Depression; revival |

| | 1818 | 1819 | 1820 | 1821 |
|---|---|---|---|---|
| United States | Mild depression | Severe depression; financial panic | Depression | Depression; revival |
| England..... | Prosperity | Recession; depression | Depression; slight revival | Slow revival |

TABLE 32—(*Continued*)

CONSPECTUS OF BUSINESS FLUCTUATIONS IN VARIOUS COUNTRIES

| | 1822 | 1823 | 1824 | 1825 |
|---|---|---|---|---|
| United States | Mild recession | Revival | Prosperity | Prosperity; panic; recession |
| England..... | Revival; prosperity | Prosperity | Prosperity | Prosperity; recession; panic |
| | **1826** | **1827** | **1828** | **1829** |
| United States | Depression; revival | Moderate prosperity | Prosperity; recession | Depression; revival |
| England..... | Depression | Revival | Prosperity | Recession; depression |
| | **1830** | **1831** | **1832** | **1833** |
| United States | Moderate prosperity | Prosperity | Moderate prosperity | Prosperity; panic; recession |
| England..... | Slow revival | Recession; depression | Depression | Revival |
| | **1834** | **1835** | **1836** | **1837** |
| United States | Mild depression | Revival; prosperity | Prosperity | Prosperity; panic; recession; depression |
| England..... | Prosperity | Prosperity; stock exchange panic | Prosperity; financial panic | Recession; panic; depression |
| | **1838** | **1839** | **1840** | **1841** |
| United States | Depression; slight revival | Revival; panic; recession | Depression | Depression |
| England..... | Depression | Depression | Depression | Depression |
| France..... | ..... | ..... | Revival | Prosperity |
| | **1842** | **1843** | **1844** | **1845** |
| United States | Depression | Depression; revival | Revival; prosperity | Prosperity; brief recession |
| England..... | Depression | Revival | Mild prosperity | Prosperity |
| France..... | Prosperity | Prosperity | Prosperity | Prosperity; bourse panic |
| | **1846** | **1847** | **1848** | **1849** |
| United States | Recession; mild depression | Revival; prosperity; panic; recession | Mild depression; revival | Prosperity |
| England..... | Prosperity | Prosperity; panic; recession | Depression | Depression; revival |
| France..... | Prosperity | Recession; panic | Depression; panic | Depression |
| | **1850** | **1851** | **1852** | **1853** |
| United States | Prosperity | Prosperity | Prosperity | Prosperity; recession |
| England..... | Prosperity | Prosperity | Prosperity | Prosperity |
| France..... | Depression | Depression | Revival | Prosperity |
| Germany.... | ..... | ..... | ..... | Revival |

TABLE 32—(*Continued*)

CONSPECTUS OF BUSINESS FLUCTUATIONS IN VARIOUS COUNTRIES

| | 1854 | 1855 | 1856 | 1857 |
|---|---|---|---|---|
| United States | Recession; depression | Depression; revival | Prosperity | Prosperity; panic; recession; depression |
| England..... | Recession | Mild depression | Revival; prosperity | Prosperity; panic; recession |
| France..... | Prosperity; brief recession | Prosperity | Brief recession | Moderate prosperity; panic; recession |
| Germany.... | Prosperity | Prosperity | Prosperity; bourse panic | Prosperity; panic; recession |

| | 1858 | 1859 | 1860 | 1861 |
|---|---|---|---|---|
| United States | Depression | Revival | Prosperity; recession | Mild depression; revival |
| England..... | Depression | Revival | Prosperity | Uneven prosperity |
| France..... | Depression | Revival | Prosperity; recession | Recession |
| Germany.... | Recession; depression | Depression | Revival | Mild prosperity |

| | 1862 | 1863 | 1864 | 1865 |
|---|---|---|---|---|
| United States | War activity | War activity | War activity | Boom; recession |
| England..... | Uneven prosperity | Uneven prosperity | Uneven prosperity; financial strain | Prosperity |
| France..... | Mild depression | Uneven depression | Depression; financial panic | Depression |
| Germany.... | Uneven prosperity | Moderate prosperity | Moderate prosperity | Prosperity |

| | 1866 | 1867 | 1868 | 1869 |
|---|---|---|---|---|
| United States | Mild depression | Depression | Revival | Prosperity; monetary difficulties |
| England..... | Recession; panic; depression | Depression | Depression | Revival |
| France..... | Revival | Recession; mild depression; bourse panic | Depression; revival | Prosperity; Prosperity bourse panic |
| Germany.... | Prosperity; recession; depression | Depression; revival | Revival | |
| Austria..... | ..... | Revival | Moderate prosperity | Prosperity; panic; recession |

TABLE 32—(*Continued*)

CONSPECTUS OF BUSINESS FLUCTUATIONS IN VARIOUS COUNTRIES

| | 1870 | 1871 | 1872 | 1873 |
|---|---|---|---|---|
| United States | Recession; mild depression | Revival; prosperity | Prosperity | Prosperity; panic; recession |
| England..... | Prosperity; panic | Prosperity | Prosperity | Prosperity; recession |
| France..... | Prosperity; recession; depression | Depression; panic | Revival | Recession; depression |
| Germany.... | Prosperity; brief recession | Prosperity | Prosperity | Prosperity; panic; recession; depression |
| Austria..... | Slow recession | Mild depression | Revival; prosperity | Prosperity; panic; recession |

| | 1874 | 1875 | 1876 | 1877 |
|---|---|---|---|---|
| United States | Depression | Depression | Depression | Depression |
| England..... | Depression | Depression | Depression | Depression |
| France..... | Mild depression | Revival | Gradual recession | Mild depression |
| Germany.... | Depression | Depression | Depression | Slow revival |
| Austria..... | Deep depression | Depression | Depression | Depression |

| | 1878 | 1879 | 1880 | 1881 |
|---|---|---|---|---|
| United States | Depression; revival | Revival; prosperity | Prosperity | Prosperity |
| England..... | Deepening depression | Depression; revival | Slow revival | Mild prosperity |
| France..... | Depression | Revival; bourse panic | Prosperity | Moderate prosperity |
| Germany.... | Recession; depression | Depression; revival | Recession; mild depression | Renewed revival |
| Austria..... | Depression | Depression | Revival | Mild prosperity |

| | 1882 | 1883 | 1884 | 1885 |
|---|---|---|---|---|
| United States | Prosperity; slight recession | Recession | Depression | Depression; revival |
| England..... | Mild prosperity | Slow recession | Depression | Depression |
| France..... | Recession; panic | Depression | Depression | Depression |
| Germany.... | Prosperity; recession | Mild depression | Depression | Depression |
| Austria..... | Moderate prosperity; bourse panic | Prosperity | Recession | Mild depression |

| | 1886 | 1887 | 1888 | 1889 |
|---|---|---|---|---|
| United States | Revival | Prosperity | Brief recession | Prosperity |
| England..... | Depression; slight revival | Revival | Moderate prosperity | Prosperity |
| France..... | Depression | Revival | Moderate prosperity | Moderate prosperity; financial strain |
| Germany.... | Depression; revival | Revival | Moderate prosperity | Prosperity |
| Austria..... | Depression; revival | Revival | Prosperity | Prosperity |

TABLE 32—(*Continued*)

CONSPECTUS OF BUSINESS FLUCTUATIONS IN VARIOUS COUNTRIES

| | 1890 | 1891 | 1892 | 1893 |
|---|---|---|---|---|
| United States | Prosperity; recession | Depression; revival | Prosperity | Recession; panic; depression |
| England | Prosperity; panic; recession | Industrial recession; financial prostration | Depression | Deep depression |
| France | Recession; mild depression | Mild depression | Depression | Depression |
| Germany | Recession | Depression | Depression | Depression |
| Austria | Uneven prosperity | Prosperity | Recession | Revival |
| Russia | Mild prosperity | Recession, depression | Depression | Revival |
| Sweden | Prosperity | Prosperity | Recession, mild depression | Depression |
| Netherlands | Mild prosperity | Recession | Depression | Depression |
| Italy | Depression | Depression; panic | Depression | Depression; panic |
| Argentina | Recession; depression | Depression; panic | Revival, recession | Mild depression |
| Brazil | Depression | Depression | Uneven depression | Depression |
| Canada | Mild depression | Depression; revival | Mild prosperity | Recession; depression |
| South Africa | Prosperity; recession; depression | Depression | Rapid revival | Prosperity |
| Australia | Recession; depression | Depression | Depression | Depression; panic |
| India | Mild depression | Depression | Uneven depression | Depression |
| Japan | Recession; depression | Depression | Depression | Mild depression |
| China | Mild depression | Mild depression | Depression deepens | Depression |

TABLE 32—(*Continued*)

CONSPECTUS OF BUSINESS FLUCTUATIONS IN VARIOUS COUNTRIES

| | 1894 | 1895 | 1896 | 1897 |
|---|---|---|---|---|
| United States | Deep depression | Depression; revival | Recession; depression | Depression; revival |
| England..... | Depression | Depression; revival last half-year | Revival; prosperity | Prosperity |
| France..... | Depression | Depression; revival | Revival | Moderate prosperity |
| Germany.... | Depression; revival | Revival | Prosperity | Prosperity |
| Austria..... | Recession; mild depression | Mild depression | Mild depression | Mild depression |
| Russia..... | Prosperity | Prosperity | Prosperity | Prosperity |
| Sweden..... | Mild depression | Revival | Prosperity | Prosperity |
| Netherlands.. | Depression | Depression | Revival | Mild prosperity |
| Italy..... | Depression | Depression | Depression; slight revival | Revival |
| Argentina.... | Depression | Lessening depression | Revival | Revival retarded |
| Brazil..... | Revival | Mild prosperity | Recession; panic; depression | Depression; panic |
| Canada..... | Acute depression | Depression | Lessening depression | Revival |
| South Africa. | Prosperity | Prosperity; recession | Depression | Depression |
| Australia.... | Depression | Depression; slight revival | Strong revival | Mild prosperity; agricultural depression |
| India..... | Uneven revival | Mild prosperity | Recession | Depression |
| Japan..... | Revival; recession | Revival | Prosperity | Prosperity; recession |
| China..... | Depression | Revival | Prosperity | Gradual recession |

TABLE 32—(*Continued*)

CONSPECTUS OF BUSINESS FLUCTUATIONS IN VARIOUS COUNTRIES

| | 1898 | 1899 | 1900 | 1901 |
|---|---|---|---|---|
| United States | Revival; prosperity | Prosperity | Prosperity, brief recession | Prosperity |
| England..... | Prosperity | Prosperity | Prosperity; recession, summer | Mild depression |
| France..... | Prosperity | Prosperity | Prosperity; recession | Depression |
| Germany.... | Prosperity | Prosperity | Prosperity; recession; depression | Depression |
| Austria..... | Mild depression; revival | Mild prosperity | Recession; depression | Depression |
| Russia..... | Prosperity | Prosperity; panic; recession | Recession; depression | Depression |
| Sweden..... | Prosperity | Prosperity | Prosperity | Recession; depression |
| Netherlands.. | Prosperity | Prosperity | Prosperity | Recession; mild depression |
| Italy..... | Uneven prosperity | Mild prosperity | Prosperity; brief recession | Prosperity |
| Argentina.... | Mild prosperity | Prosperity | Recession; depression | Depression |
| Brazil..... | Depression deepens | Depression; revival | Revival; panic; recession | Mild depression |
| Canada..... | Prosperity | Prosperity | Prosperity; slight recession | Revival; prosperity |
| South Africa. | Depression | Revival; recession | Depression | Revival |
| Australia.... | Prosperity | Prosperity | Prosperity | Recession |
| India..... | Slow revival | Moderate prosperity | Recession | Depression |
| Japan..... | Depression | Depression | Deeper depression | Depression; financial panic, spring |
| China..... | Mild depression | Revival; prosperity | Prosperity; recession; depression | Depression; revival |

TABLE 32—(*Continued*)

CONSPECTUS OF BUSINESS FLUCTUATIONS IN VARIOUS COUNTRIES

| | 1902 | 1903 | 1904 | 1905 |
|---|---|---|---|---|
| United States | Prosperity | Prosperity; recession | Mild depression; revival | Prosperity |
| England..... | Lessened depression | Depression deepens | Revival | Revival; prosperity |
| France..... | Depression | Revival | Moderate prosperity | Prosperity |
| Germany.... | Depression | Revival | Mild prosperity; recession | Revival; prosperity |
| Austria..... | Depression | Depression; revival | Revival | Mild prosperity |
| Russia..... | Depression | Depression; revival | Recession; depression | Depression |
| Sweden..... | Depression | Revival | Mild prosperity | Prosperity |
| Netherlands.. | Depression | Depression | Revival; prosperity | Prosperity |
| Italy..... | Moderate prosperity | Prosperity | Prosperity | Prosperity |
| Argentina.... | Depression; revival | Prosperity | Prosperity | Prosperity |
| Brazil..... | Mild depression | Depression deepens | Depression | Depression |
| Canada..... | Prosperity; financial distress | Prosperity | Uneven prosperity | Full prosperity |
| South Africa. | Prosperity | Recession | Depression | Depression |
| Australia.... | Mild depression | Deepening depression | Revival | Mild prosperity |
| India..... | Revival | Prosperity | Prosperity | Prosperity |
| Japan..... | Slow revival | Revival | Prosperity | Prosperity; recession; depression |
| China..... | Mild prosperity | Mild prosperity | Mild prosperity | Mild prosperity |

TABLE 32—(*Continued*)

CONSPECTUS OF BUSINESS FLUCTUATIONS IN VARIOUS COUNTRIES

| | 1906 | 1907 | 1908 | 1909 |
|---|---|---|---|---|
| United States | Prosperity | Prosperity; panic; recession; depression | Depression | Revival; mild prosperity |
| England..... | Prosperity | Prosperity; recession | Depression | Revival |
| France..... | Prosperity | Prosperity | Recession; mild depression | Revival |
| Germany.... | Prosperity | Prosperity; recession; depression | Depression | Depression; revival |
| Austria..... | Prosperity | Prosperity | Recession; depression | Depression |
| Russia..... | Depression; slight revival | Revival | Recession; depression | Depression; revival |
| Sweden..... | Prosperity | Prosperity; recession; panic | Depression | Depression |
| Netherlands.. | Prosperity | Prosperity | Depression; revival | Revival; prosperity |
| Italy..... | Prosperity | Prosperity; recession | Depression | Depression |
| Argentina.... | Prosperity | Prosperity | Mild recession | Revival; prosperity |
| Brazil..... | Slow revival | Revival; recession, autumn | Depression | Revival |
| Canada..... | Prosperity peak | Prosperity; panic; recession | Depression; revival | Revival |
| South Africa. | Depression | Depression deepens | Depression lessens | Revival |
| Australia.... | Prosperity | Prosperity | Recession; mild depression | Rapid revival; prosperity |
| India..... | Prosperity | Prosperity; recession | Depression | Depression; slight revival |
| Japan..... | Revival; prosperity | Prosperity; panic; recession | Depression | Depression; revival |
| China..... | Recession | Depression | Depression | Revival |

TABLE 32—(*Continued*)

CONSPECTUS OF BUSINESS FLUCTUATIONS IN VARIOUS COUNTRIES

| | 1910 | 1911 | 1912 | 1913 |
|---|---|---|---|---|
| United States | Recession | Mild depression | Revival; prosperity | Prosperity; recession |
| England..... | Prosperity | Prosperity | Prosperity | Prosperity; recession, last quarter |
| France..... | Prosperity | Prosperity | Prosperity | Prosperity; recession |
| Germany.... | Revival; prosperity | Prosperity | Prosperity | Prosperity; recession |
| Austria..... | Depression | Revival | Prosperity; recession; depression | Depression; panic |
| Russia..... | Prosperity | Prosperity | Prosperity | Prosperity except on bourse |
| Sweden..... | Revival | Prosperity | Prosperity | Prosperity; slight recession |
| Netherlands.. | Prosperity | Prosperity | Prosperity | Recession |
| Italy..... | Mild depression | Revival halted, autumn | Uneven prosperity | Mild prosperity; recession |
| Argentina.... | Prosperity | Recession; mild depression | Depression; revival, autumn | Recession |
| Brazil..... | Prosperity | Prosperity | Prosperity | Uneven prosperity |
| Canada..... | Prosperity | Prosperity | Prosperity | Prosperity; recession |
| South Africa. | Prosperity | Prosperity | Prosperity | Uneven recession |
| Australia.... | Prosperity | Prosperity | Prosperity | Mild recession |
| India..... | Revival | Prosperity | Prosperity | Uneven prosperity |
| Japan..... | Revival; prosperity | Prosperity | Prosperity | Prosperity |
| China..... | Recession | Depression | Depression | Depression |

TABLE 32—(*Continued*)

CONSPECTUS OF BUSINESS FLUCTUATIONS IN VARIOUS COUNTRIES

| | 1914 | 1915 | 1916 | 1917 |
|---|---|---|---|---|
| United States | Depression | Revival; prosperity | Prosperity | Prosperity; war activity |
| England..... | Mild depression deepens with war | War activity | War activity | War activity |
| France..... | Depression | War activity | War activity | War activity |
| Germany.... | Mild depression; revival | War activity | War activity | War activity |
| Austria..... | Depression | War activity | War activity | War activity |
| Russia..... | Recession; panic; depression | Uneven depression | War activity | Recession; depression |
| Sweden..... | Recession; depression | Revival, prosperity | Prosperity | Recession |
| Netherlands.. | Recession; panic; depression | Revival; uneven prosperity | Moderate prosperity | Recession |
| Italy..... | Recession; panic; depression | Uneven depression | War activity | War activity |
| Argentina.... | Depression; panic | Uneven depression | Depression; slow revival | Revival |
| Brazil..... | Depression deepens | Depression; revival | Revival; prosperity | Prosperity |
| Canada..... | Depression deepening with war | Depression; revival | War activity | War activity |
| South Africa. | Recession; depression | Slow revival | Rapid revival | Prosperity |
| Australia..... | Revival; recession | Mild depression; revival | War activity | War activity |
| India..... | Prosperity; recession | Depression | Revival | Prosperity |
| Japan..... | Recession; depression | Revival; prosperity | Prosperity | Uneven prosperity |
| China..... | Depression deepens | Depression | Revival; prosperity | Uneven prosperity |

TABLE 32—(*Continued*)

CONSPECTUS OF BUSINESS FLUCTUATIONS IN VARIOUS COUNTRIES

| | 1918 | 1919 | 1920 | 1921 |
|---|---|---|---|---|
| United States | War activity; recession | Revival; prosperity | Prosperity; recession; depression | Depression |
| England..... | War activity; recession | Revival; prosperity | Prosperity; recession; depression | Deep depression |
| France..... | War activity; stagnation | Depression; revival; boom | Prosperity; recession; depression | Depression; revival |
| Germany.... | War activity; disorganization, November | Depression | Depression | Revival, spring |
| Austria..... | War activity; chaos | Depression | Slow revival | Revival |
| Russia..... | Depression | Depression | Depression | Depression |
| Sweden..... | Depression | Depression; revival | Boom; recession; depression | Depression |
| Netherlands.. | Depression | Revival; prosperity | Prosperity; recession; depression | Depression |
| Italy..... | War activity; slight recession | Mild depression; revival | Recession; depression | Depression; panic |
| Argentina.... | Moderate prosperity | Prosperity | Prosperity; recession | Depression |
| Brazil..... | Prosperity; brief recession | Prosperity | Prosperity; recession; depression | Severe depression |
| Canada..... | War activity; recession | Revival; prosperity | Prosperity; cession | Depression |
| South Africa. | Prosperity; recession | Revival; prosperity | Prosperity; cession; depression | Deep depression |
| Australia..... | War activity | Prosperity | Prosperity; cession | Depression |
| India..... | Prosperity; recession | Revival; prosperity | Prosperity; cession; depression | Depression |
| Japan..... | Uneven prosperity; recession | Depression; revival; prosperity | Prosperity; cession; depression | Depression |
| China..... | Uneven prosperity | Prosperity | Prosperity; cession; depression | Depression |

TABLE 32—(*Continued*)

CONSPECTUS OF BUSINESS FLUCTUATIONS IN VARIOUS COUNTRIES

| | 1922 | 1923 | 1924 | 1925 |
|---|---|---|---|---|
| United States | Revival; prosperity | Prosperity; recession | Mild depression; revival | Prosperity |
| England..... | Depression | Depression | Lessening depression | Depression |
| France..... | Revival | Prosperity | Prosperity | Prosperity |
| Germany.... | Revival checked, summer; disorganization | Depression | Revival; temporary check, summer | Halting revival; recession |
| Austria..... | Uneven recession | Depression | Depression; financial strain | Depression |
| Russia..... | Depression; slight revival | Revival; recession, October | Mild depression; revival | Uneven prosperity; recession |
| Sweden..... | Depression; revival | Revival | Mild prosperity | Mild prosperity |
| Netherlands.. | Depression | Depression | Revival | Mild prosperity |
| Italy..... | Depression | Depression; revival | Moderate prosperity | Prosperity |
| Argentina.... | Depression | Lessening depression | Revival | Prosperity |
| Brazil..... | Lessening depression | Revival | Mild prosperity; recession | Depression |
| Canada..... | Depression; revival | Moderate prosperity | Recession; mild depression | Revival; prosperity |
| South Africa. | Depression | Revival | Mild prosperity | Prosperity |
| Australia..... | Slow revival | Revival; mild prosperity | Mild recession | Revival; prosperity |
| India..... | Depression | Slow revival | Revival; mild prosperity | Mild prosperity |
| Japan..... | Depression | Depression | Depression | Depression; revival |
| China..... | Depression | Depression | Depression | Depression |

## 2. How Closely the Cycles in Different Countries Agree.

Concerning the fact of fundamental interest in this inquiry, the conspectus of business conditions gives an exaggerated impression of century-long and world-wide similarity. Periods of prosperity, recession, depression and revival are here pictured as recurring in much the same way in every country and during every decade. The fuller form of the annals makes it clear, not only that this recurrence is nowhere the whole story of economic fluctuations, but also that it is farther from being the whole story in some countries than in others. The importance of business cycles as a factor in national life was less during the closing decades of the 18th century than during the opening decades of the 20th century in England and the United States. There is a similar difference between these two countries and China, Russia or Brazil at present. The more highly organized a country's business, the larger the proportion of its people who live by making and spending money incomes, the more important become the recurrent cycles of activity. Let us, however, take cyclical oscillations for granted, disregard their relative amplitudes, and inquire what influence the cycles in one country exercise upon cycles in other countries.

It has long been recognized that the great financial crises have an international sweep. Thus the conspectus shows that England and the United States shared in the crises of 1815, 1825 and 1837; that England, the United States and France (which now is represented in the annals) shared in the crisis of 1847; that these three countries, and Germany also, shared in the panic of 1857; that England, the United States, France, Germany and Austria shared in varying degrees the crisis of 1873. To these familiar facts our annals add that all five countries had mild recessions in 1882-84. Of the 17 countries included in the annals after 1890, 10 had recessions in 1890-91, 15 had recessions in 1900-01, 15 in 1907-08, 12 in 1912-13, 11 in 1918, and 14 in 1920. Further, the countries which escaped a share in these world reactions usually owed their exemption to an earlier turn for the worse. Thus South Africa and Japan had no recession in 1900-01 because they were already suffering from depres-

sion. The three countries of our 17 which escaped in 1920 were Germany, Austria and Russia.

Of course the experiences of the several countries were not identical in the years of crises and recessions. In the whole record there is no crisis which was equally severe everywhere. In 1873, for example, the United States, Germany and Austria suffered far more severely than England and France. In 1890, on the contrary, the financial strain was more severe in London than in New York or Berlin, while Vienna deferred its recession until 1892. The center of disturbance in 1900 seems to have been Germany; countries like the United States and Italy felt but repercussions of a foreign shock. In 1907 the gravest difficulties appeared in the United States. Probably the nearest approach to a severe world-wide crisis was made in 1920, and that case was obviously dominated by post-war readjustments. It is clear, however, that a financial crisis breaking out in any country of commercial importance produces financial strains in other countries, and that even mild recessions like those of 1882-83 and 1913 spread widely.

It has been less noticed that other phases of business cycles also propagate themselves. The long depressions of the 1870's, the checkered fortunes of the 1880's, the revival of the middle 1890's, the boom of 1906-7, the calmer prosperity of 1912, the hectic activity of the war years, and the severe depression after 1920 had much the same international character as the crises to which attention is often restricted.

Yet business cycles do not run a strictly parallel course in any two countries. Perhaps the best way to bring out the degree of likeness and difference in contemporary fortunes is to note the proportion of years in which conditions in different countries are described by the same terms in the conspectus, and the proportion of years in which conditions are described in unlike terms. An effort to carry out this plan shows that many years do not fall into either category. Business may be reviving in one country and already prosperous in another, depressed in one and entering depression in another; or conditions may be similar during the early part of a year and divergent in the closing months, or different at the start and convergent at the close. In such cases one cannot call the conditions quite similar or decidedly unlike. Thus it is necessary to recognize at least three types of relations between the synchronous phases of business cycles in different countries—agreement, partial agreement

and opposition. Arbitrary definitions may be adopted, and a statistical tabulation made of these relationships.[1]

Such a comparison of business conditions in the five countries for which we have annals running back of 1890 is provided by Table 33. Most of the comparisons here made show a preponderance of years in which the business cycles of the countries paired were passing through the same phases over years in which they were passing through opposite phases. The intimacy of relations is probably understated by the table; for it takes no account of the shifting relations of lead and lag in the influence exercised by business conditions in one country upon business conditions in the other country with which it is compared. As one would expect from England's position in international trade and finance, English cycles are more highly correlated with the cycles of other countries, than the cycles of other countries are correlated with each other. The closest agreements are found between English and French or English and German cycles; the loosest agreements are between Austrian and American cycles.

From the third section of the table, it appears that the international similarity of phase in business cycles increased on the whole with the passage of time. The breaking of economic bonds by the war, and the tardiness of their restoration after the Armistice, interfered with this process of synchronizing cycles. But the non-economic factors, which played so large a rôle after 1914, had much the same character and influenced business among all the belligerents in much the same way, so long as hostilities lasted. Since 1918, economic

[1] The rules followed by Dr. Thorp in preparing the data for the following table are as follows:

Agreement includes

1. Years in which two countries pass through the same phase or phases of a cycle.
2. Years in which two countries pass through at least two corresponding phases, though one may enter a third phase. Example: "Prosperity; recession" in one country, and "Prosperity; recession; depression" in another.

Partial agreement includes

Years in which two countries pass through phases of the cycle which succeed one another. Example: "Revival" in one country, and "Prosperity" in another; or "Recession" in one country, and "Recession; depression" in another.

Opposition of phases includes

Years in which opposite phases of cycles occur, whatever intermediate phases are noted. Example: "Prosperity; recession; depression" in one country, and "Depression; revival" in a second.

War activity is interpreted in this tabulation as corresponding to prosperity.
The relative severity of recessions in different countries is not taken into account.

TABLE 33.

AGREEMENT AND DIFFERENCE OF PHASE IN ENGLISH, FRENCH, GERMAN, AUSTRIAN AND AMERICAN BUSINESS CYCLES

Various Periods

| | Period Covered | | Number of Years of | | | Percentage of Years of | | |
|---|---|---|---|---|---|---|---|---|
| | Dates | Number of Years | Agreement in Phase | Partial agreement | Opposition in Phase | Agreement in Phase | Partial agreement | Opposition in Phase |
| I | | | | | | | | |
| English and French cycles. | 1867–1925 | 59 | 32 | 20 | 7 | 54 | 34 | 12 |
| English and German cycles | " " | 59 | 33 | 22 | 4 | 56 | 37 | 7 |
| English and Austrian cycles | " " | 59 | 27 | 21 | 11 | 46 | 36 | 19 |
| English and American cycles | " " | 59 | 28 | 18 | 13 | 47 | 31 | 22 |
| French and German cycles. | " " | 59 | 27 | 25 | 7 | 46 | 42 | 12 |
| French and Austrian cycles | " " | 59 | 19 | 21 | 19 | 32 | 36 | 32 |
| French and American cycles | " " | 59 | 23 | 23 | 13 | 39 | 39 | 22 |
| German and Austrian cycles | " " | 59 | 23 | 24 | 12 | 39 | 41 | 20 |
| German and American cycles | " " | 59 | 21 | 20 | 18 | 36 | 34 | 31 |
| Austrian and American cycles | " " | 59 | 18 | 23 | 18 | 31 | 39 | 31 |
| II | | | | | | | | |
| England and four other countries | 1867–1925 | 236 | 120 | 81 | 35 | 51 | 34 | 15 |
| Germany and four other countries | " " | 236 | 104 | 91 | 41 | 44 | 39 | 17 |
| France and four other countries | " " | 236 | 101 | 89 | 46 | 43 | 38 | 19 |
| United States and four other countries | " " | 236 | 90 | 84 | 62 | 38 | 36 | 26 |
| Austria and four other countries | " " | 236 | 87 | 89 | 60 | 37 | 38 | 25 |
| III | | | | | | | | |
| English and American cycles | 1790–1857 | 68 | 21 | 28 | 19 | 31 | 41 | 28 |
| | 1857–1925 | 68 | 33 | 21 | 14 | 49 | 31 | 21 |
| English and French cycles.. | 1840–1882 | 43 | 12 | 17 | 14 | 28 | 40 | 33 |
| | 1883–1925 | 43 | 28 | 11 | 4 | 65 | 26 | 9 |
| English and German cycles. | 1853–1888 | 36 | 19 | 15 | 2 | 53 | 42 | 6 |
| | 1889–1925 | 37 | 21 | 13 | 3 | 57 | 35 | 8 |
| English and Austrian cycles. | 1867–1895 | 29 | 14 | 12 | 3 | 48 | 41 | 10 |
| | 1896–1925 | 30 | 13 | 9 | 8 | 43 | 30 | 27 |

fortunes have diverged widely. Presumably the business forces tending toward convergence are gradually resuming their wonted sway.

In treating the period when the annals include 17 countries, a more significant method of presenting the relations among their business cycles is feasible. For the cycles since 1890 have an international pattern simple enough to be carried in mind, and applied to the experience of one country after another. This pattern may be sketched as follows:

1st cycle, 1890-91 to 1900-01
Recession in 1890-91; depression in 1891-95; revival in 1895-96; prosperity in 1896-00; recession in 1900-01.

2nd cycle, 1900-01 to 1907-08
Recession in 1900-01; depression in 1901-03; revival in 1903-04; prosperity in 1905-07; recession in 1907-08.

3rd cycle, 1907-08 to 1913-14
Recession in 1907-08; depression in 1908-09; revival in 1909-10; prosperity in 1910-13; recession in 1913-14.

4th cycle, 1913-14 to 1918
Recession in 1913-14; depression in 1914-15; revival in 1915; prosperity in 1915-18; recession in 1918.

5th cycle, 1918 to 1920
Recession in 1918; very brief and mild depression early in 1919; quick revival in 1919; prosperity in 1919-20; recession in 1920.

6th cycle, 1920 to —— (unfinished)
Recession in 1920; severe depression in 1921-22; revival in 1922-23; mild prosperity in 1924-25.

During this period, of our 17 countries
Six have had 5 cycles and are now in a 6th: England, France, the Netherlands, Sweden, Italy and China.
Five have had 6 cycles and are now in a 7th: Austria, South Africa, Australia, Argentina and India.
Five have had 7 cycles and are now in an 8th: Germany, Russia, Canada, Brazil, and Japan.
One has had 10 cycles and is now in an 11th: the United States.

Thus no country in our list has had fewer business cycles since 1890 than the international pattern calls for; but the majority of

countries have had one or two more than that number. These additional cycles seldom result from failure to participate in the international movements of activity and depression, but rather from the intercalation of what we may call domestic recessions between the dates of international recessions. To take the most striking case: the United States had its share in all the recessions of the international pattern; but it also had domestic recessions in 1893, 1896, 1903, 1910, and 1923. When a country skips an international recession, it is usually because that country has recently suffered a domestic recession. Thus business was already depressed in Japan and South Africa when the international recession of 1900 began; South Africa and China escaped the international recession of 1907 for similar reasons; so too the European neutrals had recessions in 1917 and not in 1918.

The countries whose business cycles diverge most from the international pattern are Italy before say 1907, Russia, South Africa, Brazil and China—all countries rather backward in economic organization and predominantly agricultural. The countries whose cycles have followed the international pattern most closely, on the other hand, are countries of highly developed industry, trade, and finance—England, France, Germany (until 1919), Sweden, and the Netherlands. Australia and Canada lag but a little behind these European powers in conformity. Austrian cycles were being assimilated closely to those of her western and northern neighbors in the decade before the war. Even British India and Japan have followed the European pattern of cycles without very striking divergencies.

Another way of summing up the international relationships of business cycles since 1890 is to run down the columns of entries in Table 32 for each year. There is no year of the 36 covered in which the same phase of the cycle prevailed in all of the 17 countries. Uniformity is approached, however, in 1893, 1899, 1906, 1908, 1912, 1916, 1920, and 1921; and in most years there is a marked preponderance of entries of similar tenor.

A graphic presentation of these facts is given by Chart 27. The irregular bands of white and of black which run vertically across the chart are not quite continuous in any year from 1890 to 1925. But the existence of a general trend toward uniformity of business fortunes is plain.

CHART 27. Conspectus of Business Cycles in Various Countries, 1790 to 1925.

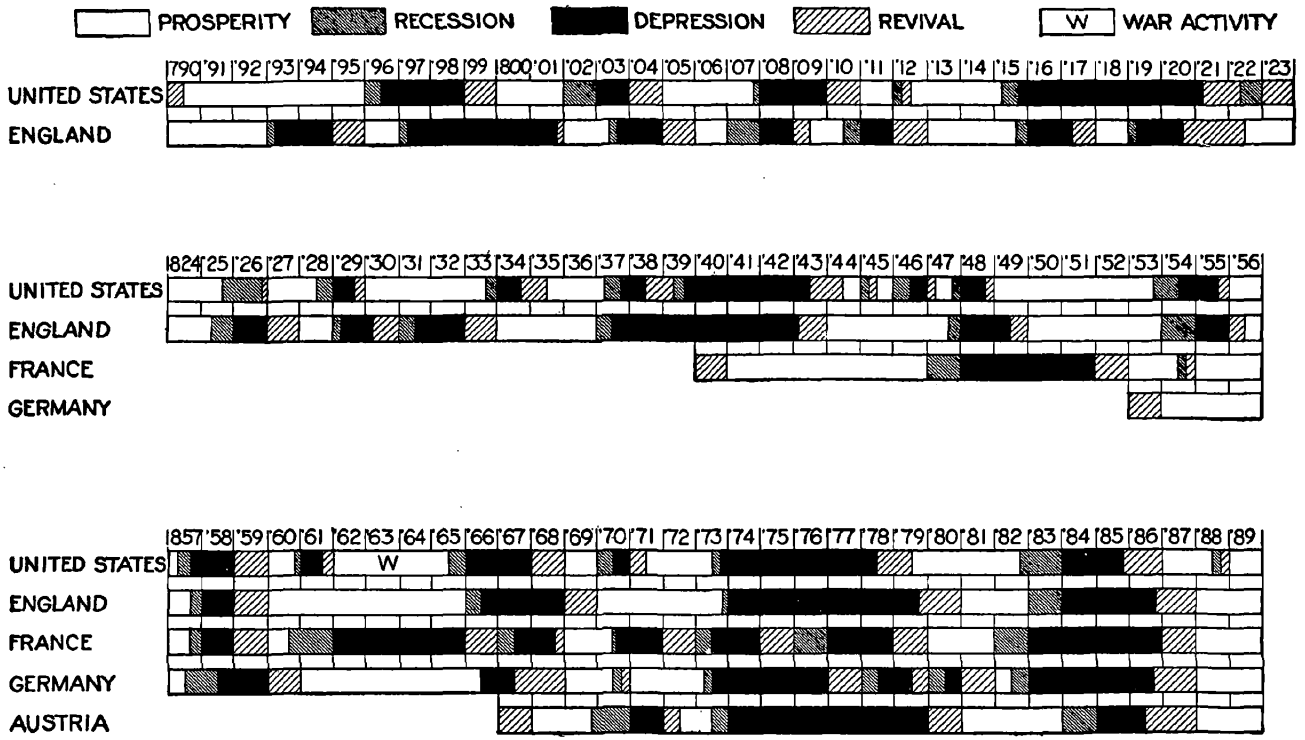
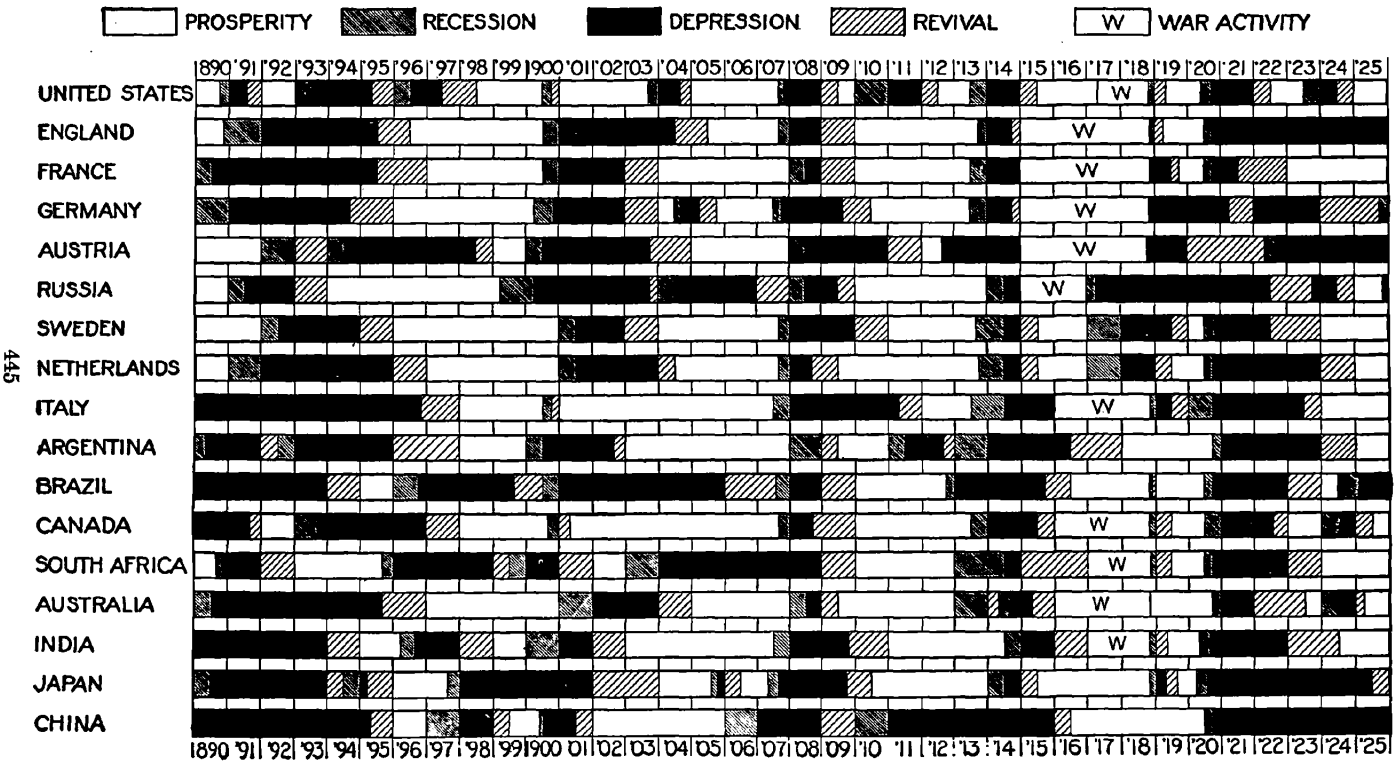


CHART 27. Conspectus of Business Cycles in Various Countries, 1790-1925—(*Continued*)



### 3. Domestic and Foreign Factors in Business Cycles.

Possibly this tendency to synchronize their phases, found in the business cycles of different countries, arises from some cosmic cause which affects all quarters of the globe in much the same way each year. Upon that daring hypothesis, our annals throw no light. But the annals do suggest certain tamer explanations, which account not only for the general resemblance among cycles in different countries, but also for their differences. These tamer explanations are not inconsistent with the cosmic hypothesis, but they do not depend upon it.

Whatever the causes of the recurrent fluctuations in economic activity may be, the annals suggest that these causes become active in all communities where there has developed an economic organization approximating that of western Europe. There appears to be a rough parallelism between the stage attained in the evolution of this organization by different countries, and the prominence of business cycles as a factor in their fortunes.

One characteristic of the type of organization in question is the wide area over which it integrates and coördinates economic activities. Bare as they are and short their span, the annals reveal a secular trend toward territorial expansion of business relations and a concomitant trend toward economic unity. For example, the American annals show how often the fortunes of the North, the South and the West diverged from one another in the earlier decades after the adoption of the Constitution, and how these divergencies have diminished in later decades. Not that business is ever equally prosperous or equally depressed in all states of the Union even now: always there are perceptible differences, and at times the differences are wide, particularly among the great farming "belts." Yet the annals picture the vastly greater population of to-day, spread over a vastly greater territory, as having more unity of fortune than had the people of the thirteen original states and the frontier settlements in 1790-1820.

Broadly speaking, the annals support a similar conclusion concerning the world at large. The network of business relations has been growing closer and firmer at the same time that it has been stretching over wider areas. The annals allow us to catch some glimpses of this double trend within the borders of a few countries besides the United States, and they show it clearly in the relations among different countries. As American business is coming to have one story, diversi-

fied by agricultural episodes, so, before the war shattered international bonds for a time, world business seemed to be approaching the time when it too would have one story, diversified by political and social as well as agricultural episodes in different countries.

The basis of this trend toward unity of economic fortunes among communities organized on the European model is that each phase in a business cycle, as it develops in any area, tends to produce the same phase in all the areas with which the first has dealings.

Prosperity in one country stimulates demand for the products of other countries, and so quickens activities in the latter regions. Prosperity also lessens the energy with which merchants, financiers, and contractors seek competitive business in neutral markets, and so gives a better chance to the corresponding classes in countries where the domestic demand is less active. Further, prosperity, with its sanguine temper and its liberal profits, encourages investments abroad as well as at home, and the export of capital to other countries gives an impetus to their trade. A recession checks all these stimuli. A severe crisis in any important center produces quicker and graver results. Demands for financial assistance raise interest rates and reduce domestic lending power in other centers; apprehensions regarding the solvency of international houses may start demands for liquidation in many places; the losses which bankruptcies bring are likely to be felt by business enterprises the world over. So, too, with depressions and revival; wherever they prevail, they exert influences upon business elsewhere which tend to produce depressions or revivals in all regions with which the center of disturbance trades.

Nor are these relations one-sided. The condition of business in every country not only influences, but is influenced by conditions in other countries. The trend toward international similarity of business cycles is enforced by an endless series of actions and reactions among the influences exerted and experienced by all the nations which deal with each other.

Of course, the degree of influence exerted by business conditions in a given area upon business elsewhere depends upon the importance of that area in international commerce and finance. Similarly, the sensitiveness of business in a given area to the influence of business conditions elsewhere is least in communities like interior China, whose economic activities are mainly self-contained, and greatest in communities which depend largely upon foreign markets, foreign invest-

ments, and foreign sources of supply, like England. It is also clear that a country of the latter type will reflect world conditions more faithfully, the more widely its foreign interests are distributed.

While this line of analysis explains the tendency of business cycles in different countries to synchronize their phases, it does not hide the obstructions which this tendency meets.

In so far as the people in any country buy and sell, lend and borrow only among themselves, they are likely to have economic vicissitudes all their own. Agricultural communities which live largely on what they produce suffer more from acts of nature than farming populations which trade extensively; but they have little share in the world dislocations of business. Even in countries where farmers are more business-like, we have noted that agriculture has a story of its own, dictated by the weather at home and abroad—a story which often differs from the story of mining, manufactures, transportation, wholesale trade, and finance.[1] Of course the agricultural story modifies the general tale. Fluctuations in the cost of raw materials and of foods, as well as fluctuations in the buying power of farm families, react upon the prosperity of other industries in proportion to the relative weight of agriculture in the country's total business. Hence, the larger the agricultural element in a given nation, the less likely are that nation's business cycles to fit neatly into the international pattern over a long series of years. For two nations with large farming interests are not likely to have closely similar harvest fluctuations year after year. The one development touching agriculture which most clearly tends toward unifying business fortunes is the decline in the proportion of families which depend on farming, and the concomitant increase in the proportion following industrial pursuits. Dr. Thorp's prefaces to the chapters of *Business Annals* show that this decline is world-wide.

While the rise of large-scale industry within a nation of cultivators, craftsmen and petty traders links its economic life to that of other nations, there may be a stage in this development when international influences seem to recede and domestic influences to grow more important. The first modern mines, factories, railways, and banks in such a country are likely to be foreign enterprises,

[1] In one way, the development of a "world market" for the great agricultural staples even increases the hazards of farming. A scanty yield of wheat in Canada, for example, does not always cause a compensatory rise of prices.

dependent upon foreign investors for their capital and perhaps upon foreign customers for their markets. During that stage, such business as the outside world recognizes in the new-old country will be peculiarly sensitive to foreign fluctuations in finance and commerce. Meanwhile, if the new ventures prosper, natives of the country will learn to practice modern methods and to consume modern products. Alongside the foreign-owned enterprises, domestic enterprises will multiply, drawing their capital from home sources and selling largely in the home market. After a time perhaps most of the early enterprises will be sold by their foreign owners to native business men. During this stage the country's business will seem to be emancipating itself from the domination of outside influences, and its business cycles will diverge more widely from the international pattern. But if the process of modernizing economic life continues until a considerable fraction of the population is affected, then a gradual reapproach toward world conditions will begin. Some such series of changes probably explains in part, but in part only, a curious feature of our Russian annals. In the earlier years covered by this record, Russian cycles followed the international pattern more closely than in the later years of the Tsarist régime.[2] Perhaps Chinese business will pass through similar stages in the not-distant future.

Besides differences in economic organization, in the proportion of people engaged in farming, and in harvest conditions, there is a host of more obvious causes of divergencies among business cycles, whether we consider successive cycles in the same country or synchronous cycles in different countries. Wars and civil disturbances play a prominent rôle in business annals, and that rôle is most erratic. Many of the differences of business fortune which the annals show seem ascribable to such factors; but we have had occasion to note that during its earlier stages, at least, the World War had a unifying effect upon conditions among both belligerents and neutrals. The after-effects of this war, however, were far from uniform in different nations. In the cycles of every country we can trace also the influence of changes in monetary conditions, banking organization and tariff acts domestic or foreign, if not the influence of changes in taxation, internal improvement plans and public regulation of business enterprises. Besides these governmental matters, it seems probable that

[2] For a fuller discussion of the relations between business cycles in Russia and in Western Europe, see S. A. Pervushin, *The Business Conjuncture*, Moscow, 1925, pp. 209-213. I am indebted to Dr. Simon S. Kuznets for a synopsis of Professor Pervushin's analysis.

differences of national habit in respect to enterprise and thrift affect the frequency and violence of business oscillations. Still other matters which may count are changes in the methods of managing investments, the integration of industry, the organization of labor, the development of social insurance. But there is little point in extending a list of factors whose relative importance we cannot weigh.

This much seems clear: business activity is influenced by countless developments in the realms of nature, politics and science, as well as by developments within the realm of business itself; few of these developments occur at the same time, in the same form and on the same scale in all countries. Thus there is no difficulty in understanding why business cycles vary in many ways from nation to nation, though it is quite impossible as yet to assign its relative importance to each (perhaps to any) cause of divergence. One's final reflection may be that the quiet business forces working toward uniformity of fortunes must be powerful indeed to impress a common pattern upon the course of business cycles in many countries. And the increasing conformity to an international pattern which the annals reveal in recent years shows that the international influences are gaining in relative importance.